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Fact Sheet #11  
Soil, Plant & Water Testing

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## Soil, Plant, and Water Testing

Soil and manure testing are the foundation of an economically and environmentally sound crop management program. Plant tissue analysis can be a very useful method for assessing crop nutrient status. In addition, rural homeowners should periodically test their well water to ensure it is safe for drinking.

There are a number of qualified laboratories in Colorado that can provide these services. There are also commercially available quick test kits which can be used at home for testing both soils and water. Without an analysis, you may be buying unnecessary fertilizer or applying too much manure to your fields. Neither practice is sound. In some cases, a \$35 soil analysis can save a crop producer thousands of dollars in unnecessary fertilizer costs.

### Proper Sampling Techniques

Obtaining a representative sample is the key to getting accurate results. Steps for proper sampling are available from your local Cooperative Extension office or from the laboratory that will analyze your samples. The main things to remember are to use clean collection implements and to obtain a sample that is representative of the soil or material you wish to have analyzed. In general, the more material you composite to form your sample, the more reliable the results will be.

### Soil Testing

Yearly sampling of each crop field is recommended to make accurate nutrient management recommendations. Routine soil sampling also provides valuable information about soil salinity, pH, and organic matter content. Collect soil cores from a variety of locations in the field to get a representative sample. Combine 20 to 30 individual

samples and mix thoroughly before filling the sample bag. Avoid (or sample separately) any unusual areas that will bias your results. Large fields should be broken into smaller sampling units based upon crop, yield, and fertilizer histories. Typically, soil is collected from the top 8 to 12 inches for routine analysis for fertilizer recommendations. Separate subsoil samples for nitrate analysis are suggested for N recommendations for irrigated crops.

Lawn and garden management can also be improved by soil sampling for nutrient analysis. Usually about a dozen soil cores to a depth of 4 - 6 inches are adequate for a typical urban lawn or garden sample.

Soils can also be analyzed for less common elements such as selenium or lead, as well as organic compounds such as pesticides or hydrocarbons. Pesticide tests are expensive and not routinely recommended unless serious contamination problems are suspected. Check with the laboratory concerning the submission of samples for pesticide testing. Sampling for organic compounds requires special handling.

Air dry soil samples prior to mailing to the laboratory and be sure to keep all samples cool. For best results, deliver samples to the laboratory as soon as possible.

### Water Testing

People who get their water from a public supply have the benefit of strict federal and state regulations governing water quality and testing. If you have a private water system, it is your responsibility to make sure your family's water is safe. Contaminated water may not taste, look or smell different from safe drinking water. Laboratory

Laboratory Name	Soil Test	Water Analysis	Manure Analysis	Nitrate Analysis Only	Pesticide Analysis in Soil or Water	Bacteriological Analysis
<b>Price Range</b>	\$15.00-\$80.00	\$13.00-\$74.50	\$28.00-\$80.00	\$6.00-\$20.00	*	\$10.00-\$50.00
<b>Most Quoted Price</b>	\$30.00	\$40.00	\$40.00	\$15.00		\$23.00
A & L Laboratories, Inc.	X	X	X	X		X
Accu-Labs Research	X	X		X	X	X
ACZ Labs	X	X		X	X	X
Agri-Test, Inc.	X	X	X	X	X	X
Analytica Environmental Laboratories, Inc.	X	X		X	X	
Aspen Analytical		X		X	X	X
Colorado Analytical Laboratory	X	X	X	X		X
CO Dept. Public Health and Env.		X		X	X	X
CSU - Soil, Water, and Plant Testing Lab	X	X	X	X		
Core Laboratories	X	X	X	X	X	X
El Paso County Dept. Health/Env.		X				X
Evergreen Analytical, Inc.		X		X	X	X
Grand Junction Laboratories	X	X	X	X	X	X
Harris Laboratories	X	X		X	X	
Hydrologic Laboratories, Inc.		X		X	X	
Industrial Laboratories		X		X		X
Inter-American Laboratories	X		X	X		
Midwest Laboratories	X	X	X	X	X	X
Northeast CO Dept./Public Health/Env.		X		X		X
Olsen's Agricultural Laboratory, Inc.	X	X	X	X		
Paragon Analytics, Inc.	X	X		X	X	
Quality-Water Bio-Lab		X				X
Root & Norton Laboratories	X	X	X	X		X
SLV Analytical Services, Inc.		X		X		
Servi-Tech Laboratories	X	X	X	X		X
Stewart Environmental Consultants, Inc.	X	X	X	X		X
Stukenholtz Laboratory	X	X	X	X		X
Trace Minerals International		X		X	X	X
Ward Laboratories, Inc.	X	X	X	X	X	X
Warren Analytical	X	X	X	X	X	X
Weld County Dept./Public Health/Env.		X		X		X
Weld Laboratories, Inc.	X	X	X	X		X
Western Laboratories	X	X	X	X	X	X

**X - indicates service provided**

\*Costs of analyzing soil or water for pesticides will vary depending on how many and which pesticides are being analyzed for.

Laboratory services, prices, and addresses may change. Contact the lab you intend to use prior to sample collection to get the most up to date information and specific sample collection instructions. Quality of laboratory services may vary. Ask the laboratory manager about areas of expertise or seek references. Listing of labs does not constitute endorsement nor does omission imply criticism. The information herein was compiled in early 1997.

**A & L Laboratories, Inc.**  
P. O. Box 1590  
302 34th St.  
Lubbock, TX 79408-1590  
(806) 763-4278

**Accu-Labs Research, Inc.**  
4663 Table Mountain Dr.  
Golden, CO 80403-1650  
(303) 277-9514

**ACZ Laboratories, Inc.**  
30400 Downhill Drive  
Steamboat Springs, CO 80487  
(970) 879-6590  
1-800-334-5493

**Agri-Test, Inc.**  
2043 Kimberly Road  
P.O. Box 4  
Twin Falls, ID 83303-0004  
(208) 734-2303  
1-800-632-0842

**Analytica Environmental Laboratories, Inc.**  
325 Interlocken Pkwy,  
Suite 200  
Broomfield, CO 80021  
(303) 469-8868  
1-800-873-8707  
Internet: [www.analyticagroup.com](http://www.analyticagroup.com)

**Aspen Analytical**  
1110 Elkton Dr., Suite A  
Colorado Springs, CO 80907  
(719) 593-9595  
1-800-866-9594

**Colorado Analytical Laboratory**  
240 S. Main St.  
P.O. Drawer 507  
Brighton, CO 80601  
(303) 659-2313  
Email: [SNeilson@csn.net](mailto:SNeilson@csn.net)

**Colorado Dept. Public Health Environment**  
Division of Laboratories  
8100 Lowry Boulevard  
Denver, CO 80220  
(303) 692-3090

**CSU-Soil, Water and Plant Testing Laboratory**  
Room A319, NESB  
Fort Collins, CO 80523-1120  
(970) 491-5061

**Core Laboratories**  
10703 E. Bethany Dr.  
Aurora, CO 80014  
(303) 751-1780

**El Paso County Dept./Public Health/Env. Laboratory**  
301 South Union Blvd.  
Colorado Springs, CO 80910  
(719) 578-3120

**Evergreen Analytical Inc.**  
4036 Youngfield St.  
Wheat Ridge, CO 80033-3862  
(303) 425-6021

**Grand Junction Laboratories**  
435 North Ave.  
Grand Junction, CO 81501  
(970) 242-7618

**Harris Laboratories**  
624 Peach Street  
P.O. Box 80837  
Lincoln, NE 68501  
(402) 476-2811  
1-800-776-1716  
Email: [BVaug12345@aol.com](mailto:BVaug12345@aol.com)

**Hydrologic Laboratories**  
695 North 7th Avenue  
Brighton, CO 80601-1559  
(303) 659-0497

**Industrial Laboratories**  
1450 E. 62nd Ave.  
Denver, CO 80216  
(303) 287-9691  
1-800-456-5288  
Email: [indlab@dash.com](mailto:indlab@dash.com)

**Inter-American Laboratories**  
P.O. Box 94  
Cozad, NE 69103  
(308) 784-4011

**Midwest Laboratories, Inc.**  
13611 B Street  
Omaha, NE 68144-3693  
(402) 334-7770

**Northeast CO Dept/Public Health/Env. Laboratory**  
700 Columbine  
P.O. Box 3300  
Sterling, CO 80751-0316  
(970) 522-3741

**Olsen's Agricultural Laboratory, Inc.**  
P.O. Box 370  
210 East First  
McCook, NE 69001  
(308) 345-3670

**Paragon Analytics, Inc.**  
225 Commerce Dr.  
Ft. Collins, CO 80525  
(970) 490-1511  
1-800-443-1511  
[bmoorman@paragonlabs.com](mailto:bmoorman@paragonlabs.com)

**Quality-Water Bio-Lab**  
9999 Olde Wadsworth Blvd.  
Broomfield, CO 80021  
(303) 466-7055

**Root & Norton Laboratories**  
P.O. Box 316  
576 Spring Creek Rd.  
Montrose, CO 81402  
1-800-595-1977  
Email: [rnllabs@rmi.net](mailto:rnllabs@rmi.net)

**SLV Analytical Services Inc.**  
411 Ross Ave.  
Alamosa, CO 81101  
(719) 589-4417

**Servi-Tech Laboratories**  
P.O. Box 1397  
1816 E. Wyatt Earp  
Dodge City, KS 67801  
(316) 227-7509  
1-800-557-7509

**Servi-Tech Laboratories**  
P.O. Box 169  
1602 Park West Drive  
Hastings, NE 68901  
(402) 463-3522  
1-800-468-5411  
Email: [edu1617@tcgcs.com](mailto:edu1617@tcgcs.com)

**Stewart Environmental Consultants Inc.**  
3801 Automation Way, Suite 200  
Fort Collins, CO 80525  
(970) 226-5500  
1-800-373-1348  
Email: [stewart@webaccess.net](mailto:stewart@webaccess.net)

**Stukenholtz Laboratory**  
Addison Avenue East  
Box 353  
Twin Falls, ID 83303  
(208) 734-3050  
1-800-759-3050

**Trace Minerals International**  
6545 Gunpark Dr., Suite #240  
Boulder, CO 80301  
(303) 530-5135  
Email: [Tracemin@usa.net](mailto:Tracemin@usa.net)

**Ward Laboratories, Inc.**  
4007 Cherry Ave.  
P.O. Box 788  
Kearney, NE 68848  
(308) 234-2418  
1-800-887-7645

**Warren Analytical**  
P.O. Box G  
650 "O" St.  
Greeley, CO 80632-0350  
(970) 351-6344  
1-800-945-6669

**Weld County Dept. Public Health & Environment Laboratory**  
1517 16 Ave. Ct.  
Greeley, CO 80631  
(970) 353-0635 x2241

**Weld Laboratories Inc.**  
1527 1st Ave.  
Greeley, CO 80631  
(970) 353-8118

**Western Laboratories**  
P.O. Box 1020  
Parma, ID 83660  
(208) 722-6564  
1-800-658-3858

analysis is the only sure method to determine the quality of your water.

If you are buying a new property or if you cannot remember when your well was last tested, you should have your water analyzed by a reputable laboratory for bacteria, nitrate, sulfate, chloride, pH, total dissolved solids (TDS), hardness, and conductivity to get baseline information on your well. Bacterial analysis is strongly recommended for all private water supplies, especially for a well in close proximity to septic systems or animal confinement facilities. Tests for pesticides, other organic contaminants, and radon are expensive and not usually recommended unless you have reason to suspect contamination.

Annual water testing is suggested to help monitor the quality of your private water supply. If you see a decline in quality, more thorough investigation is warranted. These records will provide valuable information on the history of your well if your water is ever contaminated.

When you take a water quality sample, be sure to follow your laboratory's sampling protocol. Many laboratories provide clean containers with detailed instructions on how to take the sample. If a container is not provided, use a clean plastic container which is rinsed 3 times with the well water before you collect the actual sample. Be sure to wash your hands prior to sampling and do not touch the inside of the container or lid. It is best to let the water flow for about 5 minutes before sampling, and do not draw from an aerated faucet or a swing arm faucet. For best results, water samples should be analyzed within 30 hours of the initial collection.

### **Manure Testing**

Manure testing is the best way to know the fertilizer value of manure spread on fields or gardens. Manure should be analyzed for N, P, K, micronutrients, and salt content (E.C.). There are a number of qualified laboratories in Colorado that can provide these services.

Obtaining a representative manure sample can be challenging. For proper manure sampling, you need a clean bucket and sample jar. If you are spreading manure daily, take many small samples over a representative period. For periodic spreading from a manure pack or pile, collect samples from a variety of locations in the pack or pile using a clean shovel or fork. Be sure that you collect both manure and bedding if they will be applied together. Agitate liquid manure

handling systems before sampling and collect several separate samples. Combine the individual spot samples from a particular lot or lagoon in the bucket and mix thoroughly before filling the sample jar. Keep the sample refrigerated and deliver it to the laboratory within 24 hours if possible.

Collect the samples well in advance of your spreading date so that you will have time to obtain test results and calculate the correct application rate for the crop to be grown. An accurate manure test is an excellent investment of time and money, as it may help you realize significant savings on fertilizer bills while simultaneously avoiding water contamination problems.

### **Plant Analysis**

Plant analysis during the growing season is another practice to help assess nutrient sufficiency in the growing plant. While nutrient deficiencies are many times visibly apparent, excess nutrient levels can only be determined by plant tissue analysis. This technology offers producers the ability to apply lower rates of fertilizer preplant, and to monitor and adjust plant nutrient status throughout the growing season. Plant analysis, when properly used, offers producers insurance that careful nutrient management will not negatively affect the bottom line.

### **Laboratory Services**

Individual laboratories will vary in services offered, prices, and the time they require for analysis. The laboratories listed in this fact sheet are not all inclusive and the list of services may change over time. To select a lab, consider convenience, but also think about services offered and quality. Call the laboratory manager prior to sample collection to determine lab suitability and to get more detailed information.

Be sure to keep a record of your lab results as a reference for future testing. If you need help interpreting the results of your sample, the lab manager where the sample was analyzed or your County Extension agent can assist you. Different labs may vary in analytical tests used and reported concentration values, but should not vary too much in actual recommendations. Ask your lab manager about their nutrient management philosophy to be sure it is consistent with your objectives.