

Soil Testing Laboratory

Analysis

The Kansas State University Soil Testing Laboratory offers many services to homeowners, agricultural producers, and researchers throughout Kansas and the Midwest. The lab specializes in:

- Soil testing.
- Plant, forage, and grain analysis.
- Water analysis.
- Lime analysis.

Benefits of Soil Testing

A soil test provides information about the basic fertility of soil. It is the starting point for determining how much and which fertilizers to use. Soil testing can help produce better crops, lawns, and gardens, as well as save money and prevent runoff of excess nutrients.

When to Sample and What to Test

Levels of immobile nutrients in the soil tend to change gradually over time. This means fertilizer needs can be predicted for several years from a single soil test for immobile nutrients. Test for mobile nutrients such as sulfate, nitrate, and chloride before responsive crops are planted. Soil samples for nitrate testing should be collected in the late fall or early spring before significant mineralization has occurred.

If a nutrient problem is suspected, additional sampling is appropriate. The table inside this brochure suggests different sampling depths, testing packages, and frequencies that are appropriate for different situations.

Soil Sample Collection

Test results are as reliable as the sample collected in the field. Proper collection of soil samples is required to obtain a good test result.

1. To take the sample, you need:
 - A sampling tube, auger, or spade.
 - A clean plastic pail.
 - Soil sample containers (such as pint-size plastic bags or a soil sampling bag).
 - Soil information forms from your local K-State Research and Extension office or: agronomy.k-state.edu/soiltesting
2. Draw a map of the sample area on the information sheet and divide your fields into uniform areas. Each area should have the same soil texture, color, slope, and fertilization and cropping history.
3. From each area, sample 10 to 15 cores or slices. Mix thoroughly in a clean plastic pail and fill your soil sample container from this mixture so there are about 2 cups of soil. Row crops should be sampled at 6 inches deep and permanent sod at 4 inches. For available nitrogen, chloride, or sulfur tests, a 24-inch sample is necessary.
4. Avoid sampling in old fencerows, dead furrows, low spots, feeding areas, or other areas that might give unusual results. If information is desired on these unusual areas, obtain a separate sample.
5. Label the soil container clearly. Record the sample identification on the container and information sheet.
6. Repeat the sampling procedure for each area you want tested.

For More Information

Visit the Soil Testing Laboratory's website for information about shipping labels, making online payments, and ordering soil sample bags.

agronomy.k-state.edu/soiltesting

785-532-7897

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Soil Testing Laboratory



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**Kansas State University Agricultural Experiment Station
and Cooperative Extension Service**

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Station and Cooperative Extension Service**

Fill Out Information Sheet

Information sheets are available at your local K-State Research and Extension office or at agronomy.k-state.edu/soiltesting.

1. Fill in the general information section at the top.
2. Fill in as much of the information as possible for accurate lime and fertilizer recommendations.

Be sure to:

- Indicate which tests are desired using the chart on the information sheet (see the listing of available soil tests on the Soil Testing Lab website for more information).
- For crops, indicate the intended crops, yield goals, and the previous crop.
- In the space for remarks, note any special conditions that might exist so the person making the recommendation can understand your field, lawn, or garden.

Testing Area	Sampling Frequency	Sampling Time	Sampling Depths	Testing Packages
Lawn	Every 3 to 4 years	Any	0 to 3"	Package 1, Package 2
Garden	Every 3 to 4 years	Any	0 to 6"	Package 1, Package 2
Permanent sod	Every 2 to 4 years	Fall or spring	0 to 4"	Package 1, Package 2, Environmental Package, Salt Alkali, CEC
Row crops	Immobile — every 2 to 4 years Consistent time in rotation	Fall or spring	0 to 6"	Package 1, Package 2, Envir. Surface, Salt Alkali, CEC
	Mobile — before responsive crops	Late fall or early spring	0 to 24"	Profile*, Environmental Package

* NOTE: For Profile Test (NO₃, Cl-, SO₄-S), the best time to test is every year pre-plant for cool season crops, or before soil warms up in the spring for row crops.

Shipping Samples to the Soil Testing Lab

Samples may be left at your local K-State Research and Extension office to be forwarded to the lab (postage and handling may be charged). Samples also may be sent directly to the lab by placing them in a shipping container or wrapping them in heavy paper. Include information sheets with the package. Label the shipping container and close it securely.

Mail package to:

KSU Soil Testing Lab
2308 Throckmorton Plant Sciences Center
1712 Claflin Rd
Kansas State University
Manhattan, KS 66506-5503

Contact the Soil Testing Lab at 785-532-7897 or check the website for shipping label options.

Payment may be made for analysis by check or debit/credit card via telephone or at our website. Please do not send cash. We are not responsible for cash sent in the mail.

Soil Tests

A listing of the soil analysis offered is available at agronomy.k-state.edu/soiltesting. Recommended tests have been combined into the following packages. Read the description of each test and mark the tests you desire on the information sheet. Any individual analysis can be selected or added to any package.

Package #1 — Routine Fertility (pH, buffer pH, phosphorus, and potassium)

Use this package where crops grow normally, but you want to know lime and fertilizer recommendations for optimum plant growth. The test includes pH, buffer pH on samples with a pH of 6.4 or less, available phosphorus, and exchangeable potassium. This test is adequate on a majority of the soils in Kansas, including lawns and gardens.

Package #1 plus CEC (pH, buffer pH, phosphorus, potassium, calcium, magnesium, sodium, hydrogen)

This package is recommended for a better evaluation of soil fertility characteristics and potential. Cation exchange capacity is a measure of the soil's ability to hold positively charged ions. This value provides an indication of nutrient availability.

Package #2 (pH, buffer pH, phosphorus, potassium, organic matter, and zinc)

Use this package in areas that have lost topsoil to erosion, terracing, or irrigation leveling, yet have a high yield potential for corn or soybeans. Sandy soils that are low in organic matter with high yield conditions also should be checked for zinc.

Environmental Package

(pH, buffer pH, phosphorus, potassium, zinc, copper, with paired surface and subsoil profile nitrate nitrogen, and profile chloride)

Use this package for soils that have, or will have, heavy manure applications. Accumulation of nitrates, phosphorus, and heavy metals may occur in these soils.

Salt Alkali (electrical conductivity, % sodium, pH)

Use this package for soils with potentially high salt content, which may affect plant growth.

Profile Package (profile nitrate nitrogen, sulfur, and chloride)

This package is recommended for soils that might have residual inorganic nitrogen. For an accurate estimation of profile nitrogen, sulfur, and chloride, sample at depth ranging from 0 to 24 inches. Continuous heavy applications of commercial nitrogen fertilizer or heavy rates of manure may result in residual available nitrogen, especially where yields have not been proportional to the applied nitrogen. Under summer fallow, nitrogen may accumulate. This information improves nitrogen recommendations. The samples must be air dried within 24 hours to stop microbial activity. Spread the sample on a clean sheet of paper or plastic to dry before sending the sample to the laboratory.

Fields in central Kansas that do not have a history of potassium chloride application are most likely to respond to chloride applications. Wheat, corn, and sorghum are considered responsive to chloride.

Sulfur deficiencies are most likely on sandy soils that are low on organic matter.