

When shipping several types of agronomic samples, package each type separately. For example, place soil samples in one package, nematode assay samples in another package, and plant/waste/solution samples in yet another package. Make sure each package is addressed to the appropriate laboratory.

Look for your soil test report(s) online. Just select “Find Your Report” from the left navigation bar on the Agronomic Division’s home page www.ncagr.com/agronomi. You will also receive a copy of the report in the mail. For help interpreting reports, contact your NCDA&CS regional agronomist.

For additional information, contact

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Agronomic Division

Soil Testing



*Enhancing
Land Productivity,
Nutrient Use Efficiency
& Environmental Quality*

**N.C. Dept. of Agriculture
& Consumer Services**

Reasons for Soil Testing

In North Carolina, most soils are naturally acidic and low in nutrients. Both lime and fertilizer are required for good plant growth and yield (Fig. 1). Soil testing is the best way to find out how much lime and fertilizer to apply based on the crop and existing field conditions.

Without soil testing, managing crop nutrients is difficult due to the complex nature of their interactions with the soil. Acid soils, for example, can limit root growth and cause certain nutrients to be unavailable for plants. Unless soil acidity and pH are corrected through liming, applying fertilizer may cause additional problems rather than enhance yield.

Soil testing measures the soil’s nutrient-holding capacity and provides a basis for sound land management decisions. The lime and fertilizer recommendations given on the soil test report are cost effective and help optimize crop yield. Following these recommendations also protects the environment by safeguarding against excess fertilizer application.

Types of Soil Tests

The Agronomic Division of the N.C. Department of Agriculture and Consumer Services conducts soil tests free of charge for all state residents. The tests can be either *predictive* or *diagnostic*.

Predictive (or routine) soil tests estimate the nutrient requirements of the plants to be grown. Samples for this kind of analysis are usually taken before the growing season. The report provides site-specific lime and fertilizer recommendations based on soil class, pH, levels of nutrients in the soil, and crop requirements.

Diagnostic (or problem) soil tests identify nutrient-related problems that occur during the growing season. They are like predictive soil tests, except that soluble salt levels are also measured. Test results are reviewed by a staff agronomist who makes recommendations for adjustments in fertilization based on site-specific circumstances.

A Strategy for Collecting Samples

Improperly collected soil samples are the weak link in the soil testing process. For test results to be useful, *the sample must accurately reflect the variability and conditions in the field*. A sample from a single spot cannot do this.

Before sampling, make a detailed map of your land. For small areas, simply draw a diagram. For large tracts, aerial photographs may be helpful.

Divide the map into individual sample areas of 20 acres or less. Assign a short, permanent sample identification name to each area that will help you remember its location. Keep in mind that the sample ID space on the soil test box is limited to five characters.

Each sample area should consist of only one general soil type or condition. If a field varies in slope, color, drainage or texture and if those areas can be fertilized separately, submit a separate sample for each area (Fig. 2).

If the field being sampled has been divided into sections for various crops, submit a sample for each section—even if you now plan to grow the same crop across the entire field. Areas where liming or fertilizing patterns have differed from the rest of the field should also be sampled separately.



Figure 1. Nutrient management is critical for optimum crop production.

When to Collect Samples

Collect and submit samples three to six months before a projected planting date if you want to be able to base fertilizer plans on a current soil test report. Most farmers submit samples immediately after fall harvest, making November through March the laboratory's busiest season. To avoid delays, submit samples from April through October, if your schedule will allow it.

In most cases, it is not necessary to take soil samples every year. In the coastal plain, once every 2 or 3 years is adequate; in the piedmont and mountains, once every 3 to 4 years will do. An effective strategy is to sample one-half of your land each year if you live in the coastal plain and one-third of your land each year if you live in the piedmont or mountains.

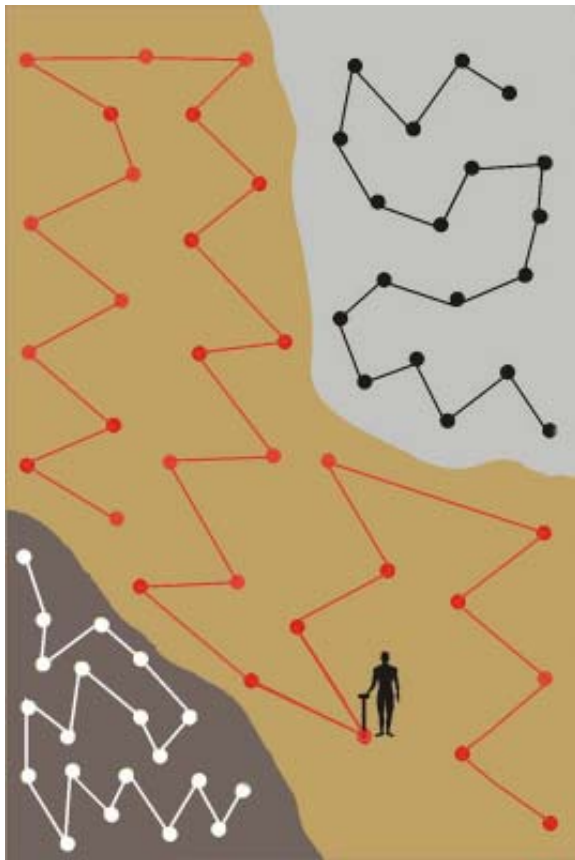


Figure 2. Sampling patterns for a field with three distinct soil types.

How to Collect Routine Samples

Essential tools for collecting soil samples include a plastic bucket and a shovel or a soil probe. Do not use brass, bronze or galvanized tools because they can contaminate samples with metals. Clean the bucket and tools before collecting samples to prevent small amounts of lime and fertilizer residue from contaminating the sample and distorting test results.

The correct depth for a sample depends on the cropping situation (Fig. 3). For cultivated row crops or vegetable gardens, sample to the depth you would plow, normally 6–8 inches. This is the zone where lime and fertilizer are incorporated. For established pasture and turf as well as for established minimum-tillage or no-till operations, sample to a depth of 4 inches. When establishing these systems, however, sample to an 8-inch depth.

Collect soil cores with a probe at 15 to 20 random locations across a field (Fig. 2). Zigzag patterns help ensure that samples accurately reflect overall field conditions and variability. Although a soil probe is ideal, cores can be collected with a shovel as follows: remove soil forming a small hole, cut a one-inch thick cross-section of soil from the wall of the hole to the proper sample depth, and carefully place the soil in the bucket.

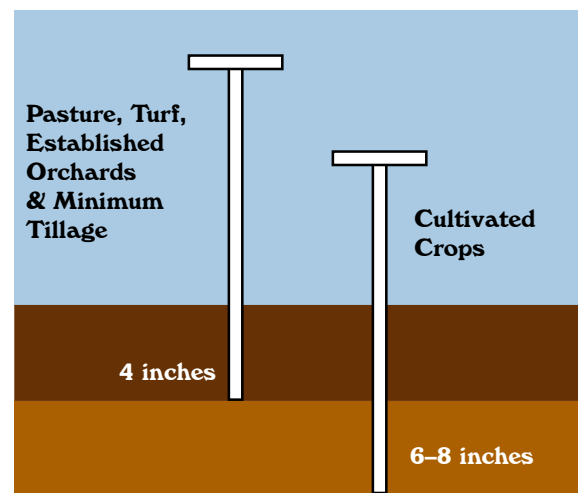


Figure 3. Proper sampling depth varies depending on the kind of crop you plan to grow.

To ensure a representative sample, avoid taking cores from small areas where soil conditions differ substantially from those in the rest of the field—for example, wet spots, severely eroded areas, old building sites, fence rows, spoil banks, burn-row areas, and old woodpile or fire sites. Also, avoid fertilizer bands where row crops have been grown. Cores from these spots can adversely influence soil test results and recommendations.

For each sample, collect and thoroughly mix at least 15 cores in a clean plastic bucket. Using this mixture, fill a standard soil sample box to the "fill line."

Provide ALL information requested on the box and the appropriate information sheet. Use *Soil Sample Information* (white form AD-1) for routine samples and *Diagnostic Soil Sample Information* (orange form AD-2) for problem samples. Boxes and forms are available from NCDA&CS regional agronomists, the Agronomic Division in Raleigh, Cooperative Extension offices and local agribusinesses.

How to Collect Problem Samples

When soil samples are being used to identify a potential plant nutrient problem, a more thorough sampling strategy is needed. Collect topsoil (as indicated in Fig. 3) as well as subsoil samples 8 to 16 inches deep. Be sure to keep topsoil and subsoil samples separate and labeled appropriately.

In both instances, follow the guidelines for collecting a representative sample. Take cores at random locations throughout the problem area even though it may be relatively small. In addition, collect a representative sample from normal areas of the same field. By comparing soil test results from normal and problem areas and from various depths, staff agronomists will be better equipped to pinpoint the problem and provide recommendations for corrective action.

How to Package Samples

Use permanent black ink when filling out the information sheet(s) and labelling soil sample box(es). Use the appropriate sample ID from your field map (see

A Strategy for Collecting Samples). Sample boxes are easiest to label before they are folded.

Use the standard soil sample boxes provided by the NCDA&CS Agronomic Division. Do not place soil in plastic bags. Close box flaps securely to prevent soil from spilling and mixing with that of other samples during shipment. **Do not tape boxes shut.** If you take samples from a quarantined area, call us for special handling instructions.

Complete all appropriate blanks on the information sheet(s) and write legibly. Be consistent from year to year in how you list your name, farm name and/or address. List the crops you intend to grow, along with the crop codes. Homeowners should use codes found under the heading *Lawn, Garden and Ornamentals*. Also, check to make sure that the sample ID on the form corresponds to the one on the soil sample box and on the farm map. Prior to placing samples in the shipping container, make certain that a sample box is present for each line entry on the information sheet.

Place individual sample boxes upright in a sturdy cardboard container for shipping. The sample box is not a shipping container! Stack samples no more than three boxes high. Place a piece of cardboard between layers to help prevent crushing of the lower boxes. Pack individual sample boxes firmly in the shipping container. Fill empty space with crumpled newspaper. Do not put more than 40 samples in a single shipping container. Shipping containers may be available from NCDA&CS regional agronomists or county extension offices.

Place information sheets inside the shipping container with the samples and keep a copy for your records. It is a good idea to place information sheets inside a sealed plastic bag to keep them clean and legible. However, never use a plastic bag to transport and ship samples.

Seal the shipping container with heavy-duty tape. Write the grower's name on the outside of the container. When sending more than one container, label each one to indicate the total number being sent: for example, "Box 1 of 3," "Box 2 of 3," "Box 3 of 3." When sending problem samples, write "Problem Samples" clearly in large red letters on the outside, top, and sides of the mailing container.