Soil Sampling Large Areas: Agricultural Crops, Pastures, Parks or Athletic Turf

The goal of soil sampling a large area is to collect a sample that provides good representation for the entire area. These guidelines may help.

Before sampling a large area, it is a good idea to make a detailed map. Copies of aerial photographs from soil surveys may be helpful. Divide the map into individual sample areas of 20 acres or less. Each unique area should ideally have similar soil type, planting history and management history.

Assign a short, permanent sample identifier to each unique area using appropriate FARM ID and SAMPLE ID designations that will help you remember the location. Keep in mind that the SAMPLE ID space on the soil box is limited to five characters.

Always use clean, stainless-steel sampling equipment and a clean, plastic bucket. Brass, bronze or galvanized tools contaminate the sample with copper and/or zinc. If the sample-mixing bucket has been used for fertilizer or other chemicals, wash it thoroughly before use.

Timing of sampling
Whenever possible, sample three to six months before planting. For field crops, submitting soil samples right after harvest provides plenty of time to plan a liming and fertilization program before the busy growing season. In September and October, the laboratory workload is relatively light, results can be returned within about two weeks, and there is no soil test fee.

The soil test report
Soil reports are available online. Visit the Agronomic Division home page, and click the link labelled Find Your Report (PALS) located in the left-column navigation bar.
The soil lab receives most of its samples from about Thanksgiving through March (peak season). A fee of $4 per sample is charged during peak season, and sample analysis may take as long as 6 weeks. Clients are encouraged to submit samples at a less-busy time, if possible.

However, if a crop appears to have a nutrient-related problem, samples for problem diagnosis should be submitted right away, regardless of the time of year. To do so, collect samples from around actively growing plants whenever growth or plant discoloration occurs.

**Frequency of sampling**
For sandy, coastal plain soils, collect samples every 2 years or test 1/2 of your land every year. These soils lose nutrients and become acidic more quickly than the fine-textured, clay soils typical in the rest of the state. In piedmont and mountain areas, collect samples every 3 years or test 1/3 of your land every year.

**Depth of sampling**
For land that will be cultivated, collect soil cores to the depth of the plow layer, usually 6 to 8 inches (Figure 1). Before establishing any large no-till or minimum-tillage areas (such as lawns, pastures or orchards), also sample 6 to 8 inches. For established no-till or minimum tillage areas where lime must be surface applied, sample to a depth of only 4 inches.

**Traditional sampling strategy**
When a 5- to 15-acre field of similar soil type will be managed uniformly, collect a soil sample of 15 to 20 cores using a zigzag pattern (Figure 2A). This approach will help ensure that overall field conditions and variability are taken into account. It is best to divide fields greater than 15 acres into smaller units (about 5 acres) until variability is known.

In any sampling, avoid small areas that differ markedly from the rest of the field—wet spots, severely eroded areas, old building sites, fence rows, spoil banks, burn row areas, old woodpile or fire sites and fertilizer application bands. Cores from such nonrepresentative areas can bias evaluations of a field’s nutrient-supplying capacity.

**Intensive sampling strategy**
Over recent years, use of global positioning systems (GPS) has become increasingly used to document soil variability. This approach to soil testing is often coupled with variable nutrient application to match soil test needs. Information about precision sampling may be found at [www.soil.ncsu.edu/publications/Soilfacts/AG-439-36/AG-439-36.pdf](http://www.soil.ncsu.edu/publications/Soilfacts/AG-439-36/AG-439-36.pdf).

**Grid sampling** is a type of precision sampling whereby samples are collected in a field that has been overlaid with grids typically 2.5 acres in size. Within a grid, cores may be collected randomly (cell sampling) or at a certain distance from the center of the grid (point sampling).

**Directed sampling** is another technique that is also used to observe soil variability and fine-tune nutrient application. Sample areas are delineated using various spatial data (yield data, electrical conductivity, elevation, etc.). Samples are usually taken randomly within a zone. Directed sampling may be referred to as zone sampling (Figure 2B).