

## The challenge of collecting a representative soil sample

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At first glance, soil sampling would seem to be a relatively easy task. However, when you consider the variability that likely exists within a field because of inherent soil formation factors and past production practices, the collection of a representative soil sample becomes more of a challenge. Before heading to the field to take the sample, be sure to have your objective clearly in mind. For example, if all you want to learn is the average fertility level of a field to make a uniform maintenance application of P or K, or sampling to develop a variable rate P application map. In some cases, sampling procedures are predetermined and simply must be followed. For example, soil tests may be required for compliance with a nutrient management plan or environmental regulations associated with confined animal feeding operations. Sampling procedures for regulatory compliance are set by the regulatory agency and their sampling instructions must be followed exactly. Likewise, when collecting grid samples to use with a spatial statistics package for drawing nutrient maps, sampling procedures specific to that program should be followed.

Regardless of the sampling objectives or requirements, there are some sampling practices that should be followed:

A soil sample should be a composite of many cores to minimize the effects of soil variability. A minimum of 10 to 15 cores should be taken from a relatively small area (two to four acres). Taking 20-30 cores will provide more accurate results. A greater number of cores should be taken on larger fields than smaller fields, but not necessarily in direct proportion to the greater acreage. A single core is not an acceptable sample.

A consistent sampling depth for all cores should be used because pH, organic matter, and nutrient levels often change with depth. Sampling depth should be matched to sampling objectives. For example, K-State recommendations call for a sampling depth of two feet for the mobile nutrients – nitrogen, sulfur, and chloride. A six-inch depth is suggested for routine tests for pH, organic matter, phosphorus (P), potassium (K), and zinc (Zn). For permanent sod or long-term no-till fields where nitrogen fertilizer has been broadcast on the surface, a three- or four-inch sampling depth would be advisable to monitor surface soil pH.

When sampling a specific area, a zigzag pattern across the field is better than following planting/tillage pattern to minimize any past non-uniform fertilizer application/tillage effects. Unusual spots obvious by plant growth or visual soil color/texture differences should be avoided. If information on these unusual areas is wanted, then a separate composite sample should be taken from these spots.

Soil test results for organic matter, pH, and non-mobile nutrients (P, K, and Zn) change relatively slowly over time, making it possible to monitor changes if soil samples are collected from the same field following the same sampling procedures. There can be some seasonal variability and previous crop effects, however. Therefore, soil samples should be collected at the same time of year and after the same crop. For example, in a corn-soybean rotation, sampling after soybean harvest in the fall would be an excellent sampling system.

Soil sampling has much to offer if done properly, but it all starts with the proper soil sample collection procedure, fall after harvest is an excellent time for soil sampling.

You can find more information on the procedure for collecting a sample at:

<http://www.butler.ksu.edu/p.aspx?tabid=63>

You can also call the Butler County Extension office at 316-321-9660

