AGRI-BRIEFS
AGRONOMIC NEWS ITEMS

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# PLAN YOUR SOIL SAMPLING PLAN

**Soil samples are collected to provide a representation of the ability of the soil to supply nutrients to meet crop needs throughout the growing season in sufficient quantities to support the expected yield**. Laboratory analysis data are compared to established calibration curves used by the laboratory to relate the nutrient content of the sample to research results showing expected crop response to similar samples. Sampling patterns and procedures should be selected with these goals in mind.

**Calibration curves used to interpret test results are based on a standard sampling depth, usually 6-2/3 inches. This is very important.** Use the sampling depth recommended by the laboratory that will do the analysis. Deviation from that depth will invalidate the comparison and the recommendations based on the test results. Under reduced tillage systems commonly used today, sampling depth is even more important. Samples should be a composite of at least 15 cores taken within the area to be represented. They should be as uniform as possible and carefully mixed in a plastic bucket. The sample sent to the laboratory should be taken from that composite.

**Sampling patterns should be selected to best represent the field and the planned method of fertilizer application.** For fields that will be managed as a uniform unit, samples can be collected at random, with the sampler being careful to cover the entire field in a zig-zag pattern, or following a uniform grid pattern. The number of samples needed, or the area represented by each sample, should be based on the anticipated variability in the field. For Midwest corn-soybean systems, the recommended density is one sample for each 2.5 acres or less…16 samples in a 40-acre field. More intense sampling is recommended if soil variability is high or where site-specific, variable-rate fertilizer application is to be used. More intense sampling means higher cost for sampling, so a good compromise is to do a 2.5-acre grid, with 10 percent additional samples collected at random to help define the variability.

**Access to other geographically referenced (GIS) databases may also help guide sampling decisions.** Where more detailed information about the field is available, such as yield monitor maps, remote sensing imagery, digital soil survey or topographic maps, or electrical conductivity data, it can be used to help define nutrient management zones to be used instead of a uniform grid. Zones should be defined in areas of 5 acres or less, recognizing again that smaller zones generally provide more accurate results, but increase soil testing costs. Collect more than one sample per zone to better define variability within the zone. All sample points should referenced with global positioning system (GPS) technology if possible, for better correlation with other GIS data.

**How the soil test data will be used will help determine whether the cores making up a sample should be collected throughout the management zone or grid or whether the cores should be taken within a few feet of a specific point.** With more emphasis being placed on GIS data sets and variable-rate application, the point sampling approach may provide more interpretation options. In that case, the 15 cores should be taken within 5 to 10 feet of the sample point, with the geographic location determined by GPS. That allows other data sets to be more specifically related to the soil test data.

**Careful attention to soil sampling patterns and techniques helps reach the goal of guiding nutrient management decisions to best meet crop needs and maintain the nutrient supplying power of the soil, while making most efficient use of fertilizer dollars and avoiding environmental problems.** Most of the potential errors in using soil testing are made in sampling procedures. Proper sampling greatly enhances the value of soil testing as a management tool. Improper sampling leads to costly errors in nutrient management decisions.

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Note: *Agri-Briefs* are available online at the PPI web site: **www.ppi-ppic.org/agri-briefs**