Soil Sampling is Key To Managing Soil Nutrients

Managing crop fertility begins with understanding current nutrient levels in the soil. Crop yield responses to soil fertility levels and fertilizer applications are among the most researched topics in agronomy and few management decisions on the farm can directly impact profitability like closely managing fertilizer inputs. At the same time, the decisions that dictate profitability closely align with protecting water quality. Phosphorus is increasingly prone to leaching and runoff losses when soil test levels exceed 100 ppm, but crop yields are optimized at far lower soil test levels. Soil sampling is a critical tool to identify areas within fields where no additional fertilizer needs to be added for optimal crop production, which can directly result in improved profitability and environmental protection.

Several steps can be taken to ensure high quality soil testing results while maximizing the utility of the data collected. Soil testing is best done in the same phase of the rotation each time. Nutrient availability is a dynamic process in the soil and soil test levels will tend to be lower in the fall compared to the spring as plant available nutrient sources are replenished from fixed soil pools following seasonal crop uptake. Mapping out a schedule for each field to be sampled each 3-4 years helps ensure consistent results from each sampling. Fields coming out of wheat, dry beans or soybeans offer plenty of time in the calendar to obtain results, analyze values and patterns, factor in data layers such as yield maps, and apply any needed fertilizer in a timely fashion.

Ensuring consistency from one sample to the next is essential to meaningful results. Consistency of depth is important, especially in fields with stratified nutrients. A knowledge of field history can help proper sampling as well, such as taking steps to account for banded fertilizer applications. Care should be taken to avoid including crop residue in samples headed to the lab.

Intensive soil sampling, such as grid or zone sampling schemes, will improve the identification of nutrient variability in the field. Managing this variability, such as through variable rate fertilizer applications, can result in significant gains in profitability from reducing fertilizer applications where high soil test levels exist and boosting crop yields in areas with deficient nutrient levels. These productivity gains typically cover the additional costs of lab testing and higher-tech fertilizer application equipment.

Plan now for fall soil sampling to identify fields and make sure these data layers are a part of nutrient application decisions. Crop advisors and agronomy retailers are valuable partners in nutrient management planning, with the capability to help obtain soil sample and analyze the results. With margins tight and attention still high on water quality, intensive soil sampling is one of the best ways to improve farm management.