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THE FUTURE OF THE ACRE

Know your soil fertility needs in tight margins

For many farmers, today's economic reality is challenging. Commodity prices have tightened profit margins while input costs remain stubbornly high.

Fertilizer continues to represent one of the largest operating expenses on most grain farms, making every pound of nitrogen, phosphorus, potassium and sulfur more valuable than ever. While cutting rates may reduce expenses in the short term, it can also limit yield potential and rob future profitability if nutrients become deficient.

Instead of simply spending less, the better approach is to spend smarter. That starts with knowing exactly what your soil contains before making fertility decisions.

Soil testing: Your most valuable investment

A soil test provides a snapshot of the nutrient bank account. Just as no business would operate without knowing its financial balance sheet, no fertility program should be built without understanding the current nutrient status of the soil.

Modern soil fertility tests evaluate several important characteristics, including soil pH, organic matter, phosphorus levels, potassium levels, calcium and magnesium, sulfur, micronutrients like zinc and boron and cation exchange capacity (CEC).

Each measurement helps determine how much additional fertilizer is truly needed to optimize crop performance. Fields often vary dramatically, even within the same farm. Areas that have received years of manure applications may have excess phosphorus and potassium, while lighter soils or highly productive areas may require additional nutrients.

One of the biggest opportunities during periods of tighter margins is eliminating unnecessary fertilizer applications. Many Midwestern fields contain phosphorus or potassium levels that are already in the optimum or high categories. Continuing to apply maintenance rates every year may not provide an economic return if soil reserves are sufficient.

Conversely, fields testing low in phosphorus or potassium are often the fields where fertilizer dollars generate the greatest return on investment.

Maximize every dollar

Precision agriculture has transformed fertility management. One of the best approaches is spreading fertilizer using Variable Rate Technology, based on harvest-time yield maps that show crop removal.

In addition, grid sampling or management-zone sampling allows producers to identify nutrient variability throughout a field. Rather than applying one blanket fertilizer rate, variable-rate application places nutrients only where they are needed. The benefits include:

- Lower fertilizer costs
- Improved nutrient efficiency
- Reduced environmental losses
- Better yield consistency
- Improved long-term soil fertility

High-testing areas receive reduced rates while low-testing zones receive additional nutrients. Similarly, with a spread-by-removal approach, high-yielding areas receive higher rates while low-yielding areas receive less fertilizer.



Photo by Beck's Hybrids

pH: Overlooked yield-limiting factor

Many farmers immediately think about nitrogen, phosphorus, potassium and sulfur, but soil pH is frequently the factor limiting nutrient availability. Even when adequate nutrients exist in the soil, an unfavorable pH can reduce plant uptake.

Corn and soybean production generally performs best when soil pH ranges between 6.2 and 6.8. Applying lime to acidic soils is often one of the highest-return investments available because correcting pH improves availability of nearly every essential nutrient already present.

Nutrient management

Unlike phosphorus and potassium, nitrogen is highly mobile within the soil. Weather conditions, denitrification and leaching all influence nitrogen availability throughout the growing season. While soil testing provides excellent guidance for many nutrients, nitrogen management should incorporate other tools such as:

- Yield goals
- Previous crop
- Organic matter
- Weather conditions
- Tissue sampling
- Split applications
- Stabilizers where appropriate

Sulfur deficiencies have become increasingly common throughout much of the Corn Belt. Reduced atmospheric sulfur deposition, higher-yielding crops and lower organic matter soils have all contributed to increased sulfur demand.

Likewise, zinc deficiencies occasionally appear in corn grown on highly eroded or low organic matter soils.

Although micronutrients receive considerable marketing attention, soil and tissue testing remain the best tools for determining whether deficiencies exist.

Tissue testing

While soil testing measures nutrient availability, tissue testing evaluates what the crop is absorbing. Together, these tools provide a much clearer picture of fertility status. If tissue tests reveal deficiencies despite adequate soil test levels, growers may uncover issues involving root development, moisture stress, soil compaction or unfavorable pH rather than simply inadequate fertilizer rates.

Data-driven decisions

One poor fertility decision can affect multiple crop years. Mining nutrients during periods of tight margins may temporarily improve cash flow but often leads to declining soil fertility that becomes expensive to rebuild later.

Likewise, repeatedly applying nutrients where they are not needed ties up valuable working capital without improving yields.

Successful growers increasingly rely on data rather than habit. Historical yield maps, soil tests, tissue analyses, satellite imagery and field observations all contribute to better fertility decisions.

Farms are becoming more capable of matching fertilizer applications with actual crop demand. Knowing the current state of your soils allows you to make confident decisions, eliminate unnecessary expenses and direct fertilizer dollars where they will generate the greatest return.

Along with knowing your soils and fertility levels, understanding how the hybrids you plant build yield and respond to fertility placement and timing is a critical component to getting the most out of your fertility investment. Through years of research, technological developments, and desire to help farmers succeed Beck's has developed a unique approach to hybrid management. Beck's SeedIQ™ and the Seed IQ systems research allows farmers to understand nutrient management by hybrid as it relates to fertility placement and timing through Root Reveal and Kernel Reveal research.