Always avoid collecting samples after fertilizer application. Ideal before spring warm-up is after sampling time (K', Zn, pH).

Measuring "Residual" N and 5 in particular are more reliable than the immobile nutrients (K', Zn, pH).

What is the best time to collect soil samples?

- Potassium and high testing soils
- Sulfur management
- Target pH and other soil benefits
- Lime and pH in long term no-til
- Sorghum fertility for top yields
- Best time to collect soil samples

Questions/Topics for today

2021 K-State Crop Talk Series

Professor and Soil Fertility Specialist

Dorthea Ruiz Diaz

2021 Season

Soil fertility questions from growers for the
Band-applied Zn and sorghum grain yield

Sorghum grain yield with chloride

Sorghum nitrogen uptake vs. yield

Nutrient uptake by sorghum for N, P, and K.

Nitrogen and P demands vs corn at comparable yield levels:

- 170 bu/a
- Yield contest: Kansas dryland top yields: 170

Kansas sorghum yields in 2020
Other factors:
- Effect of herbicide efficacy under no-till system?
- Changes in soil pH with surface lime application
- Changes in soil pH under no-till systems

Surface lime for no-till

Yield response to surface lime application for wheat, corn, and soybean.
- Ongoing improvements in fertilizer sources (smaller 
  residual) in the soil
- However, regular use of elemental S may provide 
  sulfur oxidation process with all applications 
  Dry environment and low temperature may slow the 
  fertilizer sulfur sources and application time

Target pH and Yields

Soil pH

Target pH: 6.0-6.4
- Situations target pH of 6.0-6.4 for most cropping
- For most cropping

Sulfur source applied fall pre-plant for 
- Wheat 10 lbs/acre - Flag Least 5
- Sulfur source applied fall pre-plant for 
- Wheat 10 lbs/acre - Yield

Data and Stats
Poor correlation between soil test sulfur and actually measured rates of sulfur can contribute to yield losses. High demand for sulfur during the rapid growth of corn and need for fertilizer can be difficult to estimate. Interpreting soil test results and soil texture can help with soil fertility management.

Soil test sulfur and accumulation in clay layers

Yield response with in-season sulfur application

Response 10 days after application
Questions:

- Moisture, compaction, etc.
- Other factors affecting K uptake? (root growth, wheat)
- Can increase yields in corn, sorghum and (Potassium fertilizer) also provide chloride
- Soybean is the bigger user of K per bushel

Potassium fertilization in high-soil testing:

- Testing K - soybean
- Potassium fertilization in high soil

Sulfur in corn for different soils: