- Micros: Zn and Cl
- Sulfur
- Soil pH
- Phosphorus
- Nitrogen
- Sorghum

Most common limiting nutrients for sorghum fertility for top yields

Always avoid collecting samples after fertilizer application

Ideal before spring warm-up is

Profile from previous crops

Measuring "Residuals" affected by mineralization

N and P in particular are

More flexibility but be

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-till
- 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
Dorothy 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
- Yields levels?
- Nitrogen and P demands vs. corn at comparable
- 170 bu/a
- Yield contest: Kansas dryland top yields: 170-
- Kansas sorghum yields in 2020

- N from organic matter (25%) = 40 lbs
- 230 lbs of N total uptake
- 350 lbs N from fertilizer
- 250 lbs N from fertilizer
- 40 + 40 = 110
- Some possible N fertilizer = 40 lbs
Other factors:
- pH effect on herbicide efficacy under no-till systems
- Inches of the soil profile
- The increase in soil pH was only in the upper three inches of the profile
- Yield response to surface lime application for wheat, corn, and soybean
- Small crop yield increase with lime (assess economic surface lime for no-till application)
- Ongoing improvements in S fertilizer sources (smaller residual S in the soil).
- Sulfur availability is lower in residual S containing soils.
- However, regular use of elemental S may provide benefits for sulfur availability in soil, even in low temperature environments.

**Fertilizer Sulfur Sources and Application Time**

- Wheat: 10 lbs/acre – Fall application.
- Sulfur source applied fall pre-plant for better yield.

**Soil pH Values**

- Target pH and Yields
- pH values can vary significantly across the field: use variable rate.
- For most crops, target pH is 6.0-6.5.
Poor correlation between wheat and relatively shallow rooting can contribute to
- High demand for S during the rapid growth of corn and
- Rate of mineralization can be difficult to estimate
- Need to sample soil organic matter and soil texture can help with

Soil test sulfur

Soil test sulfur and accumulation in clay layers

Yield response with in-season sulfur application

(Residue application of S in wheat)
Questions

- Moisture, compaction, etc.
- Other factors affecting K uptake, plant growth
- (can increase yields in corn, sorghum and
- Potassium fertilizer (KCl) also provide chlorine
- Soybean is the bigger user of K per bushel
- Testing K
  - Potassium fertilization in high soil

Test K – Soybean
Potassium fertilization in high soil

Critical soil test K value
- Soil test K = 35 ppm
- Critical soil test K value

Sulfur in corn for different soils