

# Soil Testing UPDATE

**Sandra L. Wick**

K-State Research and Extension  
Post Rock District Crop Production Agent



**K-State Research and Extension  
NC/NW Fertility Schools**

January 29, 2024

Osborne

# Why soil sampling and testing?

---

- Determine how much fertilizer to apply ?
- Determine how much nutrient is available from the soil?



# Probability of Fertilizer Response

---

P Test Level, ppm	Probability of Response
<5	85-100%
6-12	60-85%
13-20	30-60%
20-30	10-30%
>30	0-10%

# Overview

---

- **Proper soil sampling**
- **Taking soil samples**
- **Proper sampling depths**



# Proper soil sampling

---

- **Consistency in depth of sample.**
- **Appropriate number of subsamples.**
- **Proper care of collected samples.**
- **Attention to details.**



# Basic tools

---

➤ Soil probe

➤ Bucket

➤ Bag



# Considerations

---

## ➤ Recommended sampling depth:

➤ 0-6 inches = pH, P, K, Zn, Fe, B.

➤ 0-24 inches = Nitrate, Cl, S.

## ➤ Where in the field?

## ➤ When?



# Types of soil sampling: **WHERE** in the field

---

- Simple random – good in “non-variable” fields.
- Systematic – follow some pattern to cover different areas.
- Stratified – by management zones.
- Composite – mixing all sample units.

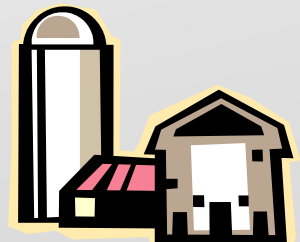




# WHEN to Take Samples

---

- Sampling can take place during any period of the year.
- However, it is best to sample a field at about the same time of year. Be **consistent**.
- Wait a minimum of thirty days to sample after applications of fertilizer, lime, or sulfur.



# When to take tests for N, S and Cl

---

- For corn and sorghum, late winter or early spring is ideal.
- For wheat, before planting in the fall.



# Number of Cores and Acres per Sample

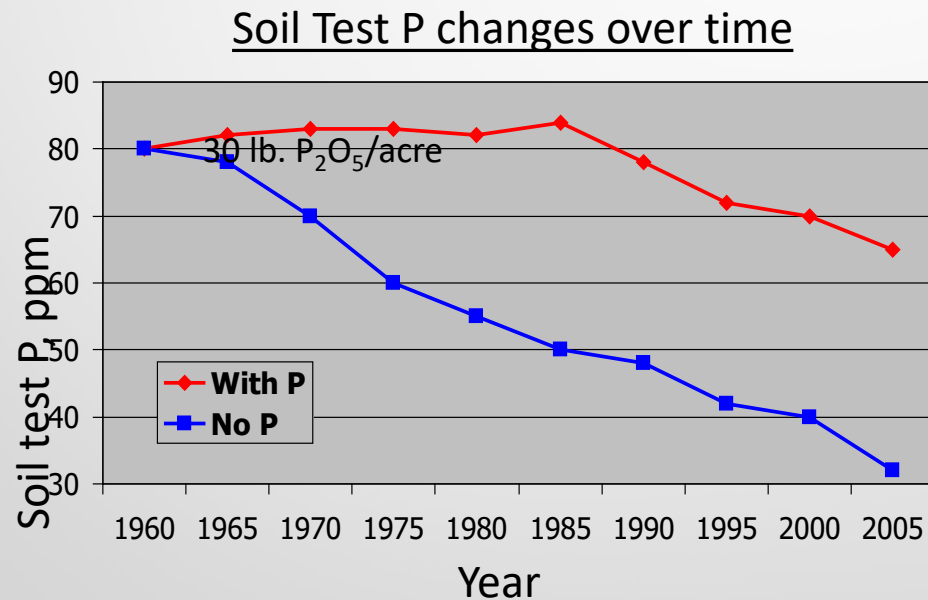
---

- At least 15-20 samples of area being sampled (about 40 acres).
- A smaller number can introduce variability into the results from different sampling years.



# How often should I sample?

- Every 2-4 years or every rotation.
- Every year to develop history.



Barney Gordon, 2008

# How to prepare samples for shipment to the lab

---

- Ideally, use soil bags from an Extension Office or from your coop.
- Should not be dried before submitting.
- Precautions:
  - Do not put the soil sample in your truck cab for a few days.
  - Refrigerate if several days before mailing.



# Useful soil tests

---

- Profile Nitrate-N
- Bray P-1 Extractable P
- Olsen Extractable P
- Mehlich III Extractable P
- Exchangeable K
- DTPA Extractable Zn
- Chloride
- Soil pH
- Lime Requirement / Buffer pH
- Soil Organic Matter



# K-STATE

## Research and Extension

**KSU Soil Testing Laboratory**  
2308 Throckmorton Plant Sciences Center  
1712 Claflin Road  
Manhattan, KS 66506-5503

Tel: 785-532-7897 Fax: 785-532-7412  
www.agronomy.ksu.edu/soiltesting

*Knowledge  
for Life*

### Soil Test Report

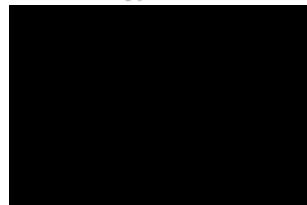
**Billing Account #: 30**

**Sample Information:**

**Prepared For:**

Sandra Wick  
Post Rock Ext Dist - Mitchell  
115 S. Hersey  
Beloit, KS 67420

**Send Copy To:**



Sample ID: Gasper 1

Order Number: 5143  
Lab Number: 002687

Received: 10/20/2016  
Reported: 10/24/2016

swick@ksu.edu

County:  
(where sample was taken)

### Results

Analysis	Value Found	Analysis	Value Found
Soil pH (1:1, soil:water)	6.3	Buffer pH	6.4
Organic Matter (LOI), %	2.4 %	Nitrate (NO3) surface or 1st sample	19 ppm
Phosphorus (P) Mehlich-3	36 ppm	Potassium (K)	500 ppm
Zinc (Zn) DTPA Extraction	0.5 ppm		

**Wheat (Target pH of 6.0) Yield Goal: 55.0 bushels / Acre**

### Nutrient Graph

Nutrient	Very Low	Low	Medium	Optimum	Above Opt	Very High
pH	6.3	4.7	5.5	6.0	7.0	8.5
P	36	7	14	20	40	100
K	500	41	81	130	161	300
Zn	0.5	0.3	0.6	1.0	2.0	4.0

Lime ECC	Nitrogen, N	Phosphorus, P2O5	Potassium, K2O	Zinc Zn	Sulfur S	Boron B	Chloride Cl
All Nutrient Units in lbs / acre		Suff		Suff			
0	40	0	0	0			

Comments:

# KSU Soil test interpretations and recommendations

**Soil Test Interpretations  
and Fertilizer Recommendations  
in Kansas**





# Summary

---

- Soil samples should be representative of the field.
- Recommendations were developed based on calibrations for specific soil depths.  
**Sampling depth is important.**
- Take lots of cores.
- Profile nitrogen can be a source of nitrogen for the following crop as well.



# Summary

---

➤ Yield goal is a key factor for current recommendations, be realistic about yield potential.



➤ Recommended sampling depths:

➤ 0-6 inches = pH, P, K, Zn, Fe, B.

➤ 0-24 inches = Nitrate, Cl, S.

➤ Sampling technique presents the greatest chance for errors in results.



# Questions?

**Sandra L. Wick**

**-K-State Research and  
Extension**

-Post Rock Extension District

-Crop Production Agent

[-swick@ksu.edu](mailto:swick@ksu.edu)

-785-282-6823

-postrock.ksu.edu

