# Recommended practices for soil sampling

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**Crop Production Agents**

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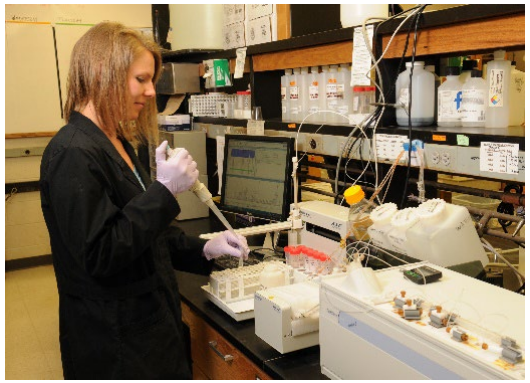

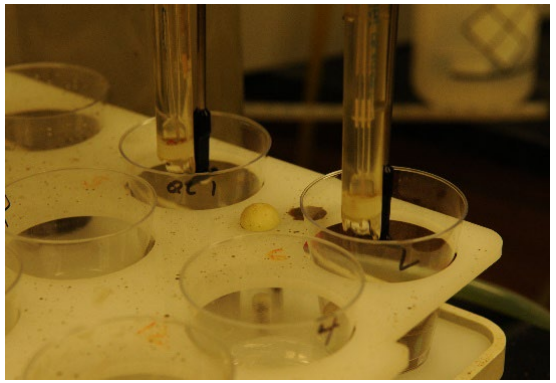

# Why soil sampling and testing?

- Determine the fertility status of soils
- Should fertilizer or lime be applied?
  - How much?
- Monitor long-term trends in soil fertility
- Diagnose problems or problem solving

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# Components of soil testing and fertilizer recommendations

1. Field sampling
2. Lab analysis work
3. Interpreting lab results
4. Making fertility recommendations

What is the main source of error?

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# Main challenges for a representative soil sample

1. Temporal variability: sampling time
2. Spatial variability: where to sample and number of cores
3. Stratification in soils: sampling depth

<u>Other considerations</u>

- Basic tools
- Sample handling

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# Temporal variability: When to collect samples

- Approximately 30 days before planting the crop
- Any time of year is okay, but be consistent
- Allow time for lab work and to determine the next steps
- Do not sample within 30 days of applying fertilizer or a soil amendment

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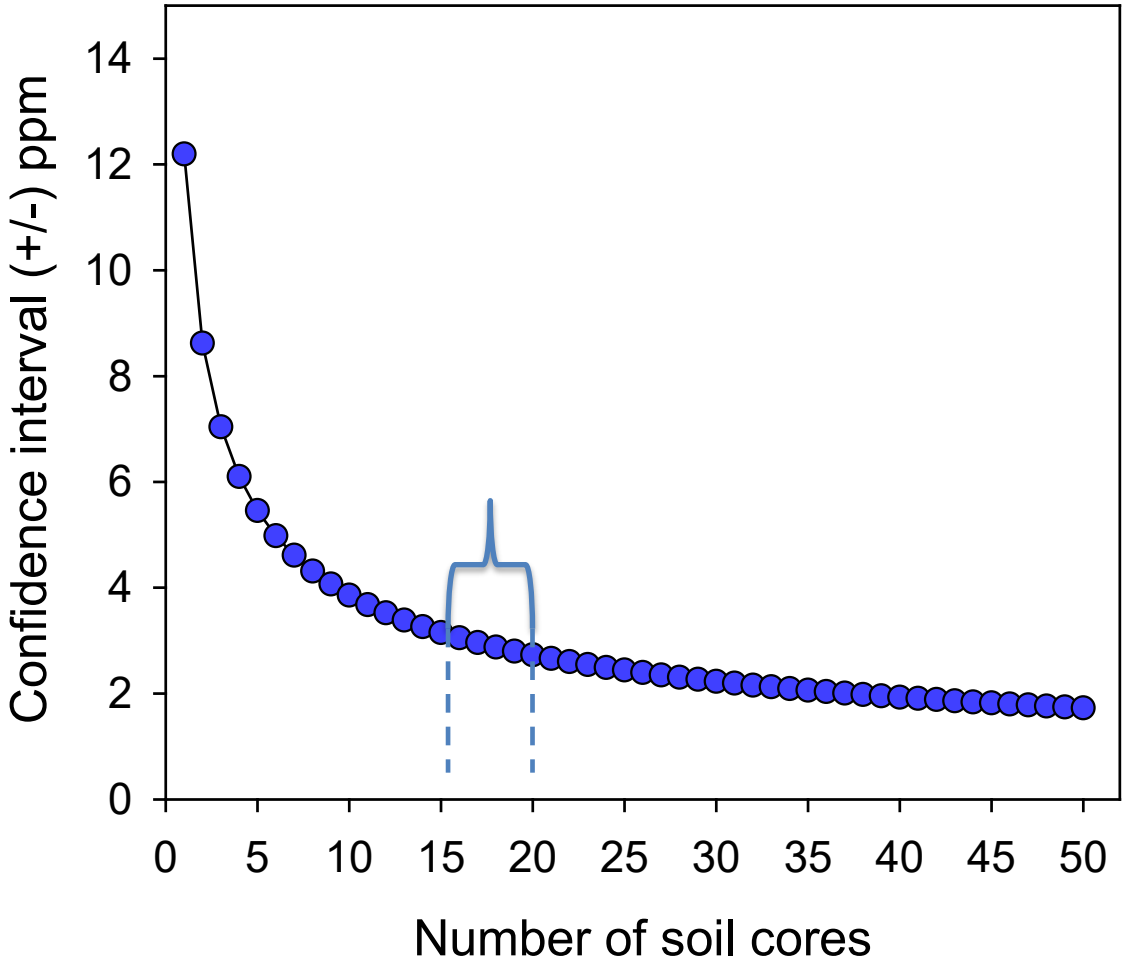
# Temporal variability: When to collect samples: residual NO3, S, Cl

- Corn, sorghum, soybeans
  - Late winter to early spring
- Wheat
  - Before planting in the fall
- Most turf and forage grasses
  - Cool season similar to wheat
  - Warm season similar to corn

# Spatial variability: Number of cores to collect

- More cores per sample = more accuracy, but also more cost
- 15-20 cores is often the economic optimum for fertilizer prescriptions
- Research shows that 30+ cores may be needed in some cases, fields with high variability

# Spatial variability: Number of soil cores and variability in soil test P

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# Spatial variability: Where to collect cores?

- Composite – Field average
- Zone – Account for management practices and soil type
- Grid – VRT and intensive mgmt.
- Pros and cons to each, consider economics


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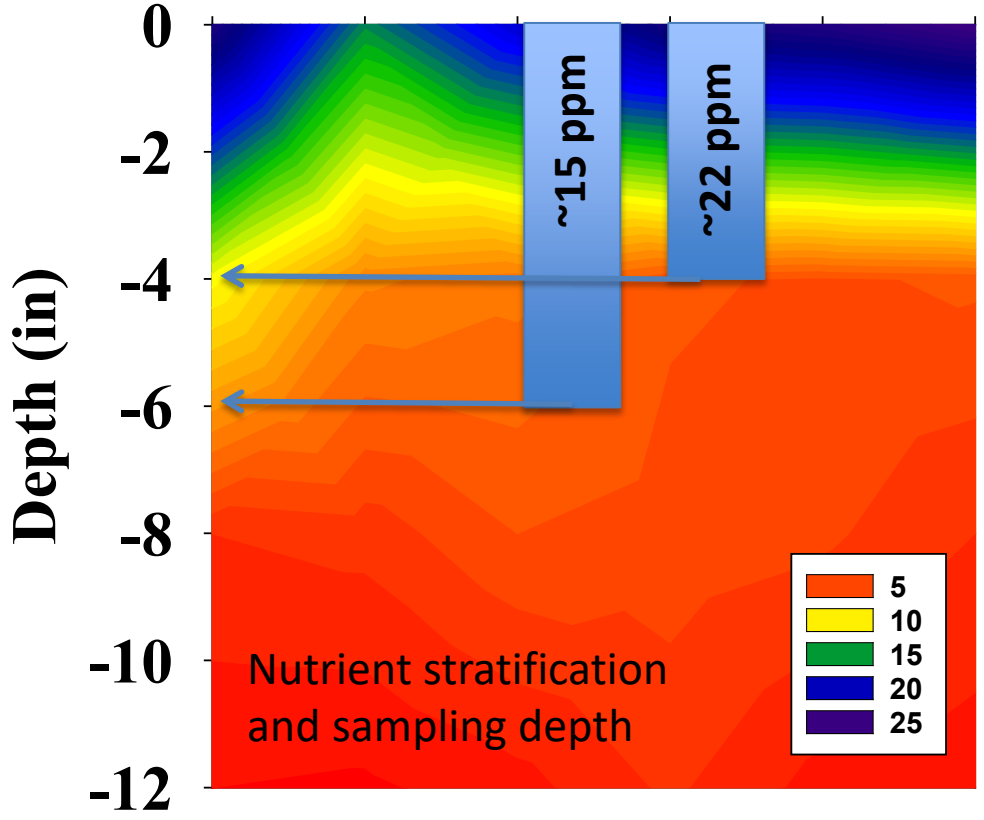
# Stratification in soils: Sampling depth




Consistent sampling depth: K-State guidelines and recommendations based on **6 in depth**

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# Basic tools

- Soil probe
- Plastic bucket
- Sample bags

# Basic tools


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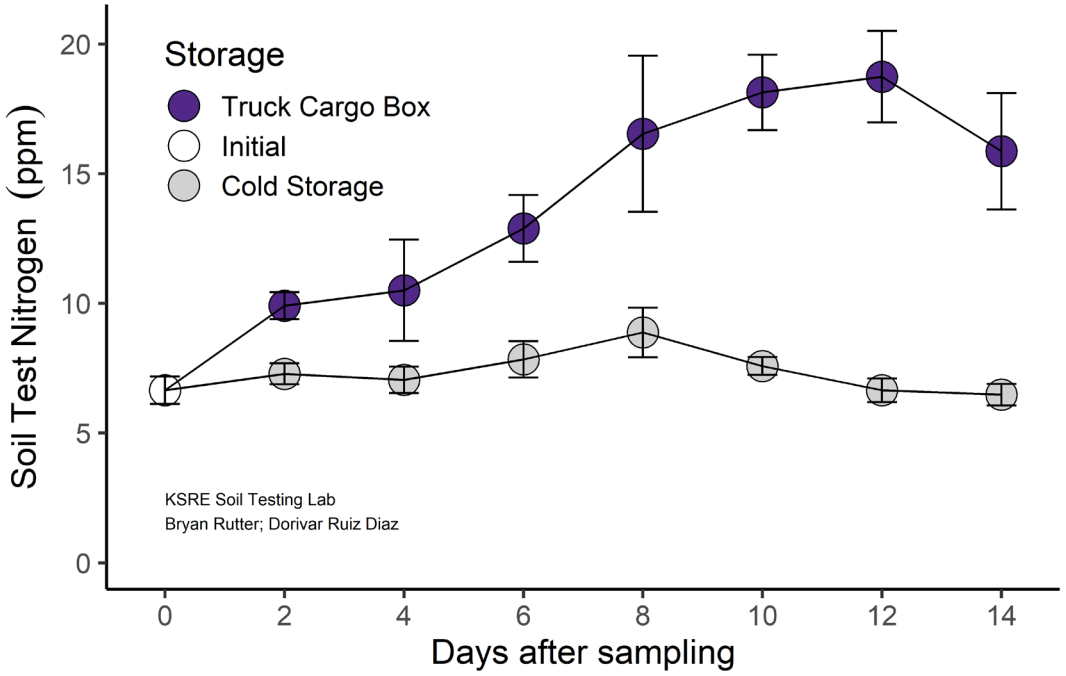
# Sample handling and shipping

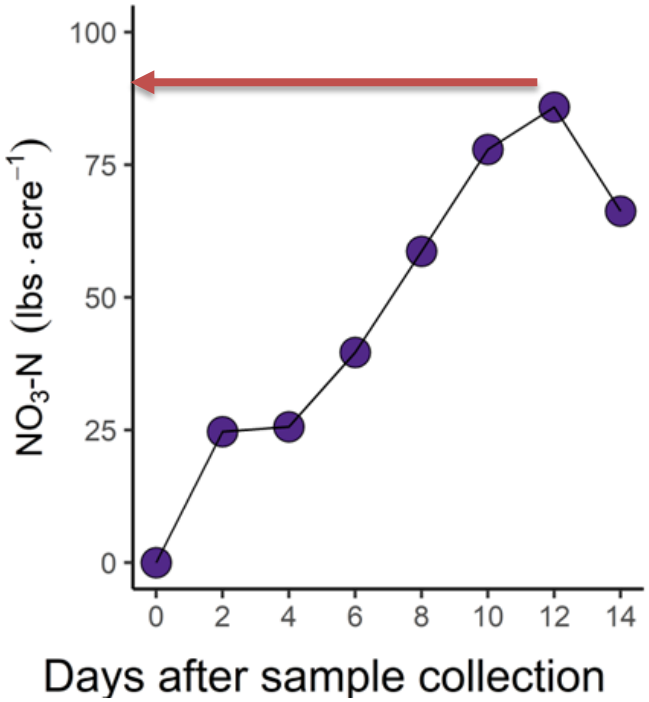
- Avoid contamination with dirty buckets, galvanized buckets, etc.
- Never oven dry soil samples!  High temperatures can alter test results, especially K.
- Critical for nitrate-N and sulfur: air dry or refrigerate if the sample won't be shipped for a few days.

# Sample handling and effect on nitrogen tests

## Soil test nitrogen




## Error in lbs. N/acre

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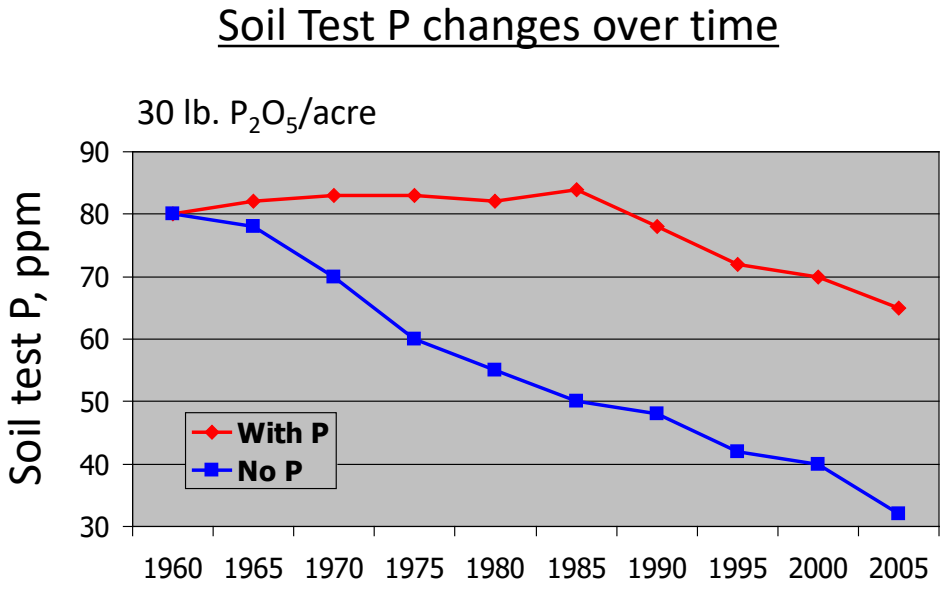
# How often should I sample?

- What's the goal?
- Routine fertility: 2-4 years or every rotation
  - Immobile nutrients and pH
- Evaluate trends and history: Every year




Barney Gordon, 2008

# Summary: Proper sampling in the field

- Appropriate number of subsamples
- Consistent sample depth
- Proper handling after collection
- Pay attention to details
- Provide detailed information to allow for good fertilizer recommendation

# Questions?

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