Can improving soil health improve yield?

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Soil health: the 10,000 foot view

Soil Health Principles
1. Keep the soil covered
2. Minimize disturbance
3. Keep plants growing throughout the year
4. Diversify plants
5. *Incorporate livestock*
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Soil Health Functions
1. Plant productivity
2. Provides physical support
3. Cycles nutrients
4. Water movement
5. Filters potential pollutants

Outcomes

Physical
Soil Health
Chemical
Biological
Do biologically active soils produce greater yields than less active soils?
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Overview
- Rainfed corn systems w/ replicated N rate trials
  - ~30 sites on farm and research trials

Soil health practices
- Cover crops
  - No covers, barley, rye, radish, clover
- Tillage
  - Chisel, moldboard, no-till
- Rotation length
  - Continuous corn, corn-soybean, corn-corn-soybean, and corn-corn-corn soybean, corn-soy-wheat, corn-wheat
- History of manure use
Look at this!!

"Study finds 50% of people bored by statistics."
Measuring soil health

- POXC
- Respiration
- Organic Matter
- Soil protein

• Not directly measured
• Comprised of multiple variables
Findings

- Pre-plant nitrate wasn’t strongly related to yields
- Improved soil health increases yields!
  - 10% increase in soil health = 5% relative increase in yields
- N fertilizer increases soil health
But wait… “every field is different”™!
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Some FAQs

What management(s) should I use?
• It will depend - get your soil tested.

Where can I get my soil tested for soil health metrics?
• Commercial labs: Brookside (blinc.com) and Ward Labs (wardlab.com)
• University labs: Cornell (soilhealth.cals.cornell.edu) and University of Missouri (cafnr.missouri.edu/soil-health)

How do I interpret my soil test for N management?
• If you’re sampling at the same time and using the same lab, you want your values of POXC, OM, and soil protein to be increasing.

How long are soil health tests applicable for N fertility decisions?
• We used average corn yield for up to 5 years after sampling – so a few.

How much less N can I apply?
• We don’t have this kind of precision yet. Stay tuned!
Thank you!

Questions, comments, etc.