# Soil Health Experiences

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# Farm Background

- Central Indiana
- Primarily corn/soybean rotation
- Mostly no-till (tillage only after tile installation or corn after corn) since 1990s
  - Began with highly erodible ground
  - Experimented on a section of a farm over several years
  - I was a hard sell on the system, but it worked
- Started with cover crops in early 2000s
  - Cereal rye

# Farm Background

- Soil sample every 4 years (following soybeans), may move to 2
- Split apply N, S, micronutrients, municipal biosolids

# Cover Crop / No-Till Goals

- Long-term improvements
  - Soil health (biology, OM, nutrient availability)
  - Improved soil structure
  - More consistent high yields
  - Less erosion
  - Less fertilizer, chemicals…eventually, maybe
- Less labor, equipment, fuel
  - More efficient
  - Less overhead

# No-Till Experiences

- Less equipment
  - 2 tractors and planters
  - Still have tillage equipment, but rarely use
  - Still hire spraying done (for now)
- Less labor (big benefit when weather doesn't cooperate)
  - Spring - one person planting corn, one person planting beans
  - Fall - less post-harvest work
- No-till beans = easy
- No-till corn takes more management
  - Row starter, hybrid selection, planter modifications

# No-Till Experiences

- Less erosion
  - Wind & water
  - Still have some, but covers help
  - Less nutrient runoff
  - I hate erosion, the best soil leaves first
- Improved soil structure
  - Firmer
  - Less compaction
  - Better water infiltration

# Cover Crop Experiences

- Started flying cereal rye in corn prior to harvest
- Moved to drilling or incorporating after harvest, if possible
- Sometimes spread with fertilizer if conditions don't allow incorporation
- Mixes ahead of corn
- Cereal rye ahead of beans replaces burndown
  - Easy program to start with
  - Easier to financially justify
  - Helps with weed control

# Cover Crop Experiences

- Involved with various USDA funding sources
- Easier for us to implement as we were already no-tilling
- Plant beans green
  - Planted in heights from 12 inches to 6+ feet tall
  - Killing before planting (if it is big) can cause issues if weather turns wet
  - Limited issues
    - Harder to make replant decisions
    - Tall cereal rye can leave residue until harvest
    - Voles (often not enough to hurt yield, worse in dry years)

# Current Equipment Program

## Corn

- Fall
  - Fertilizer (P, K, micros, biosolids)
  - Burndown or cover crop
- Spring
  - Fertilizer (Sulfur)
  - Terminate cover crop
  - Plant
- Summer
  - Post-spray herbicide
  - Sidedress (Nitrogen, Sulfur, micros)
  - Fungicide as needed

## Soybeans

- Fall
  - Fertilizer (P, K, micros)
  - Burndown or cover crop
- Spring
  - Terminate cover crop
  - Plant
- Summer
  - Post-spray herbicide and micros
  - Fungicide as needed

# Yields

- Maintaining good yields for the area
  - Corn 20+ county averages
  - Beans 5+ county averages
  - Combination of – soils, drainage, fertility, conservation practices
- CC vs non-CC fields?
  - Nothing noticeable, but hard to track
    - Haven't done partial fields
    - Differences in farms (tiling, soils, fertility)
  - No yield drag
- Did see improvement with move to no-till, especially on poorer farms

# 2019 Prevent Plant

- Planted covers on all PP acres
  - All PP acres were going to corn
  - Mixes seeded in bean stubble
- Seemed better than repeated tillage or spraying
- Tremendous growth
- A lot of insects, wildlife
- Really good yields in 2020, 2021

# Evolution

- Stopped flying cereal rye
  - Concerned about roots getting into tile
    - Didn't have any issues in 2019 with PP
    - Likely due to installation issues in many cases
  - Ended up in neighboring fields
  - Sometimes poor stands
    - Spread pattern
    - Residue at harvest smothering out
  - Expensive application
  - Was a good way to experiment early on

# Evolution

- Cut ryegrass use
  - Can be hard to control volunteer escapes/late germ
  - Especially flown on
  - Tried before corn and beans in the past
- Don’t like grass ahead of corn
  - If done, kill early
  - N tied up
  - Prefer mixes
    - Grass in a mix works fine
    - Simulates rotation
- Still like cereal rye before beans

# Evolution

- Focus on putting covers on the same farms each year
  - Look for long-term improvement
  - Similar to no-till, doing tillage resets the clock
  - Interested in adding wheat to rotation for longer CC growing season (grow N)
- Application has varied (depending on weather/harvest timing)
  - Aerial
  - Drill
  - Spread with fertilizer
  - Spread with fertilizer and incorporate
  - Prefer incorporation, especially in bean stubble
  - Cereal rye has done well spread on top

# Current Cover Crop Program

**Corn**

- Varies
- 2019 PP acres
  - Oats
  - Buckwheat
  - Flaxseed
  - Red clover
  - Balansa clover
- 2020/2021
  - Clover (forget species)
  - Barley
- Have used other mixes and ryegrass

**Soybeans**

- Cereal rye

# Landlord Relationships

- Landlord enjoys seeing the covers
  - Started farming his land when he retired
  - He was a no-tiller
  - Tiling his farm
  - Yields improving, less erosion
- Fortunately, other landlords have not had any issues
- For those hard to sell
  - Start with – no-till, cereal rye before beans
  - Might be easier if erosion is an issue on the farm
  - Start small, simple

# Questions?