Background

- CIG On-Farm Trials Soil Health Demo 2019
- 3 Year Project in Eastern CO, KS, NE
- Increase adoption of soil health management systems in the High Plains
  - Provide financial assistance
  - Offer technical and social support
  - Evaluate soil health, nutrient density, economic, and social outcomes
Objective 1: Financial Assistance

Progress
- $551,094.81 paid to 24 producers
- CSHMPs, per acre payments (capped at $10k per year), mentoring activities
- More than 3,000 acres enrolled each year

Learnings
- No one-size fits-all for practices
- Incentive payments were a motivating factor to apply for FARMS and break down risk for producers
- Flexibility is important
  - “FARMS doesn’t feel like your manager, but like a close collaborator or an organization that enables innovation and risk-taking.”
Objective 2: TA and Social Support

Progress

- Expanded TA resources
  - Educational Events/Courses
  - Individual Consultations
  - 4 on-staff TA's to assist with CSHMPs
- More than 23 producer events
- Mentoring network where 6 of the long-term soil health producers mentor the other 18 producers
- Site visits: 1-on-1 and small groups, with mentors, admin team, and peers
Objective 2: TA and Social Support

Learnings

Technical Assistance: Diversify

- **TA Resources**
  - Local soil health generalists for easy on-site visits w/context
  - Remote experts for advanced one-on-one consulting

- **Diverse Events**
  - Public field days, webinars, tours, peer group meetings

Mentorship: More Admin Support

- Mentors find the relationships that are building during the program beneficial
- The administrative burden of mentorship is taxing
- Goals-based vs. geographic mentoring
## Learnings about Supporting Producers

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Possible Solutions</th>
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<tbody>
<tr>
<td>Sparking new ideas and questions</td>
<td>● Experts presenting at field days and webinars</td>
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<td></td>
<td>● Publicizing producers’ challenges to the group to get new ideas and resources</td>
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<td>● Conversation facilitators</td>
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<td>Discomfort asking questions in front of a group</td>
<td>● Small groups</td>
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<td>● Building friendships - getting to know each other</td>
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<td>● For larger webinars: solicit questions via text beforehand</td>
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<td>Sense of isolation</td>
<td>● Make space for social events around programming</td>
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<td>● Make intentional introductions</td>
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<td>Paperwork burden</td>
<td>● Flexibility on helping producers complete all tasks</td>
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<td></td>
<td>● Individualized assistance (call, text, reminders, email)</td>
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<td>Constantly changing environmental, market, and labor conditions</td>
<td>● Maintain flexibility by allowing changes to soil health plans during the year</td>
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Objective 3: Evaluation

Progress

- Soil Health
  - Baseline sampling completed in Summer 2020
  - Producer in-field soil assessments (SETs) are complete for Y1 and Y3

- Nutrient Density
  - Two years of mineral and protein data in grain have been collected and analysis is ongoing

- Economics
  - Approximately half of the producer’s economic and management data collected
  - The Willingness-to-Pay study will study consumers' perception of regenerative agricultural practices, and which attributes of regenerative agriculture resonate with consumers the most.
  - Case studies are in the scoping and planning phase

- Social
  - Baseline qualitative interviews and social network map complete
Baseline data collected

**Biological**
- Total Biomass
- Diversity Index
- Biomass of: bacteria, rhizobia, fungi, protozoa, others
- Fungi:Bacteria ratio
- Predator:Prey ratio
- Respiration of biomass (CO2 per day)
- Biologically available carbon (active C)
- Biological enzymes: NAG, BG

**Climate**
- Lat/long
- Potential evapotranspiration
- Annual precip

**Physical / Chemical**
- Bulk Density
- Aggregate stability
- Organic Matter LOI %
- Texture (% sand, silt, clay)
- Minerals (N, P, K & S, Zn, Fe, Mn, Cu, Ca, Mg, Na)
- pH
- CEC/Sum of Cations
- % Sat (H, K, Ca, Mg, Na)

**Nutrient Density**
- Total average protein
- Ca, P, K, Mg, Zn, Fe, Mn, Cu, S, Mo
Baseline data collected

**Economic**
- Net operating income for each FARMS primary field, calculated using partial enterprise budgets
- Yields, inputs and seed costs, sales prices, and equipment operating costs

**Social**
- Barriers to adoption and challenges implementing regenerative practices
- Overall stress and wellbeing
- Coping mechanisms
- Job satisfaction
- Social networks

**Management**
- **RI score**: how intensely do you *manage* for soil health? How strongly are you addressing the soil health principles of reduce disturbance, increase cover, living roots, diversity, and incorporate livestock
- 3 years of **Comprehensive Soil Health Management Plans**
- 3 years of practice verifications: *practice purposes, implementation details, results, learnings*
Objective 3: Evaluation

Learnings

- Social network map
  - Includes: Talk about farming practices, Go to for technical assistance, Go to for advice, and Discuss challenges
- Social (Barriers to Adoption)
  - Changing minds and practices takes time and generations.
  - There are critical institutional barriers to regenerative practices
  - Experiences with conservation programs aren’t always positive.
Objective 3: Evaluation

Learnings

- Economics
  - Producers find value in individualized economic calculation support for their soil health experiments and test plots

- Soil Health
  - End-of-project sampling - Summer 2023

- Nutrient Density
  - Minerals & Protein
  - USDA FoodData Central database is inadequate for use as a benchmark
  - Calcium is elevated across all samples, including controls - 400% of USDA standard
  - More data analysis including management practices need to be conducted.
  - Producers are interested in results
What's next? Year 3 and Beyond

2022
- Producer support: field days, producer events, consultations
- Social science data collection and analysis
  - Barriers to adoption interviews
  - Social network analysis

2023
- Finish Year 3 producer payments
- Finish data collection and analysis
- End of project field day/event
- Continue to facilitate and support producer network
Questions?

www.farmsproject.org
# Toolkit for public use at farmsproject.org/toolkit

**In-field Soil Evaluation Tool**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Low (1 point)</th>
<th>Moderate (2 points)</th>
<th>High (4 points)</th>
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</thead>
<tbody>
<tr>
<td>Erosion risk (SEC)</td>
<td>Soil crumbles easily</td>
<td>Soil crumbles easily but is cohesive</td>
<td>Soil crumbles easily but is cohesive and holds together</td>
</tr>
<tr>
<td>Water balance (SEC)</td>
<td>Waterlogged for &gt;24 hours after heavy rain</td>
<td>Waterlogged for 1-24 hours after heavy rain</td>
<td>Dry for &gt;1 week after watering</td>
</tr>
<tr>
<td>Tillage resistance (SEC)</td>
<td>Splits easily</td>
<td>Splits with difficulty</td>
<td>Splits with no difficulty</td>
</tr>
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**Comprehensive Soil Health Management Plan**

<table>
<thead>
<tr>
<th>Producer Name</th>
<th>Address</th>
<th>Soil map? (Y/N)</th>
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<tbody>
<tr>
<td>Soil evaluation tool:</td>
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Looking back at last year:

- Last Year’s FARMS Practices
- Soil health principles
- What goals did you have for this practice? (from the CSHP)

- What challenges did you face in this field last year? How did you address them?
- Did you hit your goals? Why?
- How did your FARMS practices impact the rest of your operation? Economics, rotation, other conservation practices?