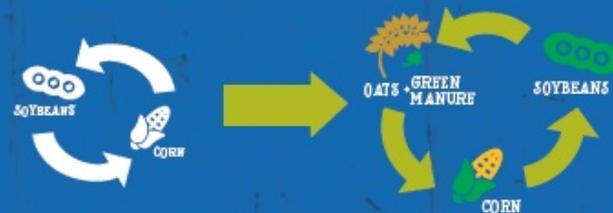


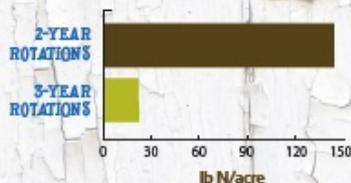
SMALL GRAINS, LARGE GAINS

HOW SMALL GRAINS CAN HELP COMPANIES MEET CONTINUOUS IMPROVEMENT GOALS



GREENHOUSE GAS REDUCTION

MANUFACTURING NITROGEN FERTILIZER IS VERY ENERGY INTENSIVE. CORN GROWN AFTER SMALL GRAINS + GREEN MANURE CROPS REQUIRES 88% LESS MANUFACTURED FERTILIZER.



PESTICIDE USE REDUCTION

DIVERSE ROTATIONS CAN CONTROL WEEDS EFFECTIVELY WITH UP TO 6 TIMES LESS HERBICIDE USE.



2-YEAR ROTATIONS



3-YEAR ROTATIONS

COMPETITIVE FARM PROFITS

REDUCING INPUT COSTS RETURNS MORE TO THE BOTTOMLINE.

PROFIT 2008 - 2015

2-YEAR ROTATIONS **\$357/ACRE**
 3-YEAR ROTATIONS **\$371/ACRE**

"INCORPORATING MORE LEGUMES INTO MY ROTATION LETS ME CUT BACK ON NITROGEN FERTILIZER RATES."



- TIM SIEREN, PFI MEMBER

IMPROVED WATER QUALITY

SMALL GRAINS AND GREEN MANURE CROPS KEEP ROOTS IN THE GROUND YEAR-ROUND AND NITRATES OUT OF THE WATER FOR MORE MONTHS.

3-YEAR ROTATIONS:



GROUND COVERED
61%
OF TIME

2-YEAR ROTATIONS:



GROUND COVERED
42%
OF TIME

Iowa Small Grains Pilot 2016 Report



SUSTAINABLE
FOOD LAB

AGENDA

- Pilot Overview
- Production Results
- Cool Farm Tool Results
- Key Findings: Constraints and Opportunities
- Looking Ahead: Small Grains in 2017
- Discussion

Pilot Overview



Farmers grew oats and PFI coordinated efforts to increase oat production knowledge



The Sustainable Food Lab coordinated actors across the value chain to support market connectivity



Value chain actors advised farmers and partners on opportunities to expand the market for oats



Farmers used the Cool Farm Tool to translate farm management practices into GHG benefits

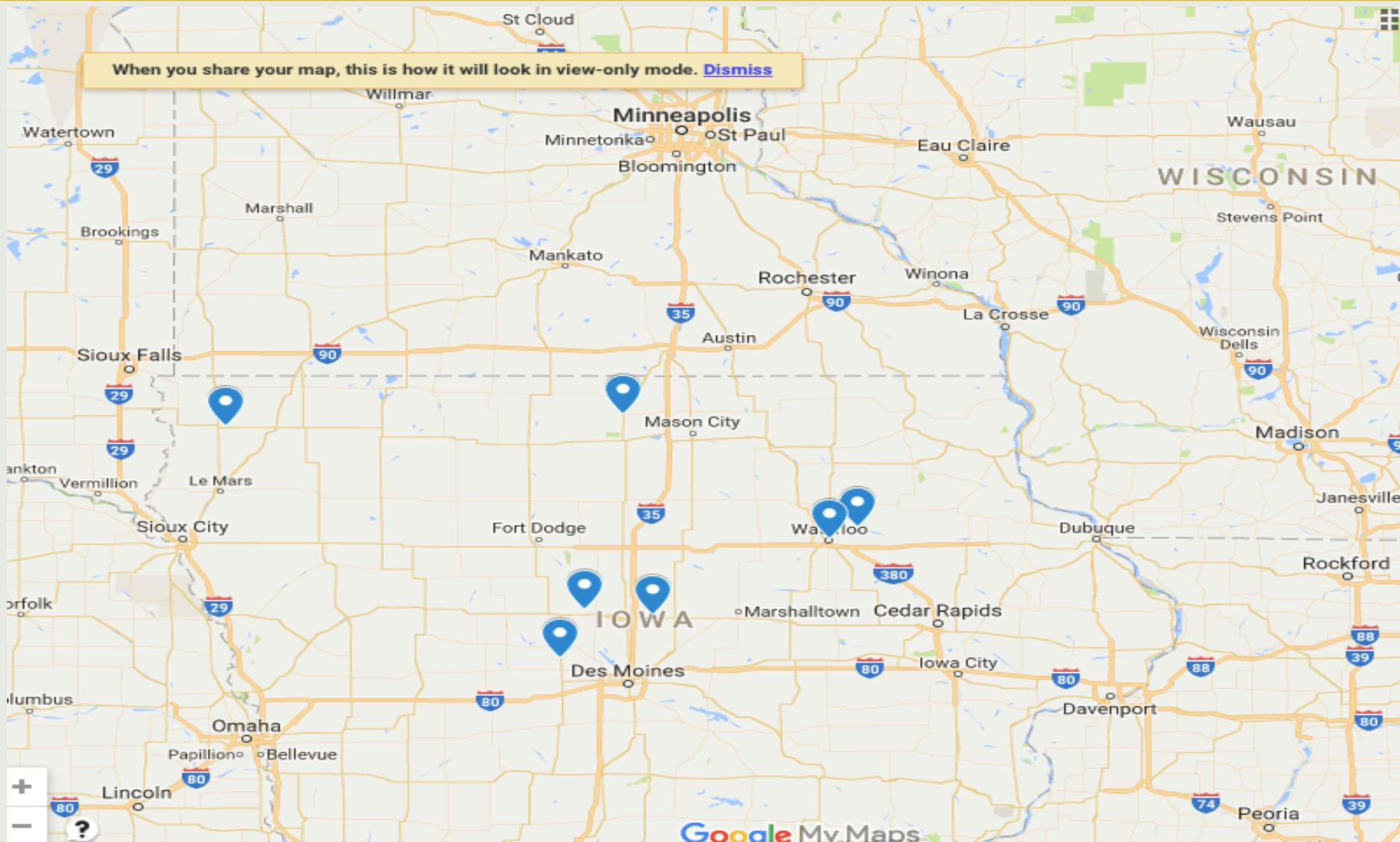


REPUTATIONAL RISKS



Pilot Overview

❖ 7 Farmers ❖ 240 Acres ❖ 21,649 bushels ❖ 385.61 Tons



Production Results

Farmer	Acres	Yield (bu/acre)	Test Weight (lbs/bu)
A	15.3	85	35
B	25	60	38
C	32	141	36
D	50	90	38
E	26	90	32
F	20	94	38
G	72	90	34
Total	240.3		
Average	34	92.8	36

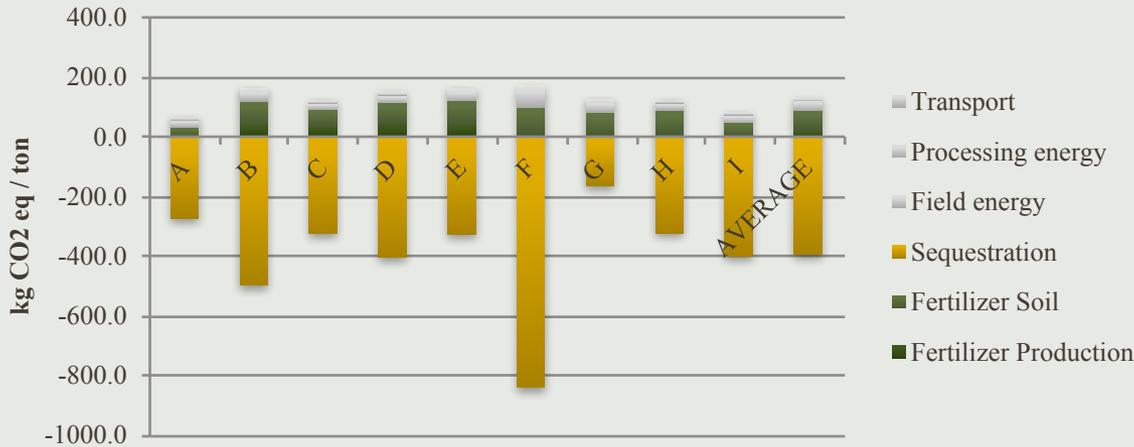
Production Results

Overview of Farm Management Practices

- Reduced tillage
- Fertilizer applied (avg. 40 lbs/acre)
- No herbicide used
- Limited disease/pest pressure
- Baled oat straw
- Planted oats with a green manure cover crop
- Rotation: soy – oat – corn

Cool Farm Tool Results

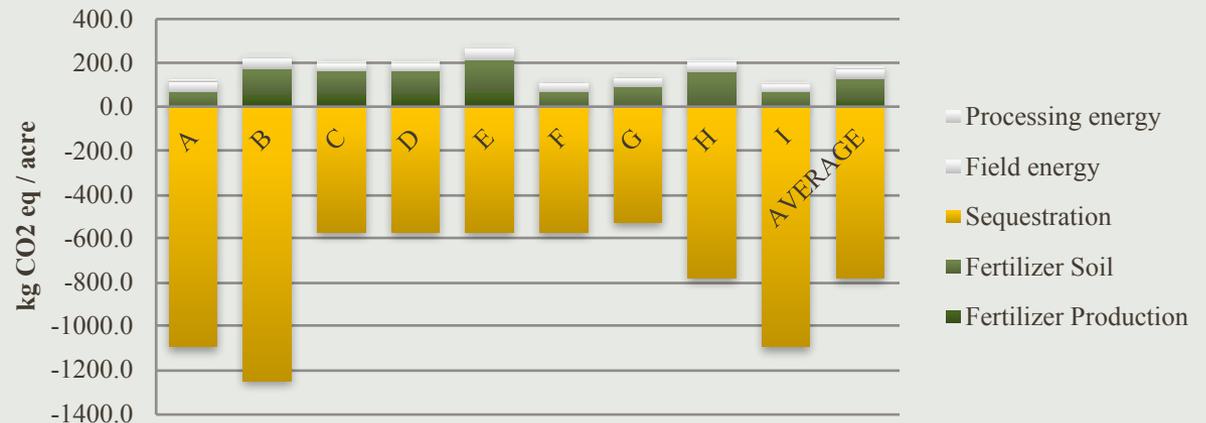
Oat GHG / ton



Average per ton: -429

Average per acre: -613

Oat GHG /acre (inc no-till where applicable)



Key Findings

FARMERS

- All farmers will plant oats again next year
- Timing of planting and harvest, and post-harvest handling were biggest challenges
- A few farmers sold to the local feed market, most are still marketing oats
- Whole farm enterprise budgets are needed to support rotation economics

MARKETS

- Feed market represents the largest potential demand, a commodity livestock chain feed ration is the hard to change when farmers don't have choice
- Food grade is possible in the Midwest
- Sustainability benefits are available for rotationally raised corn and soybeans

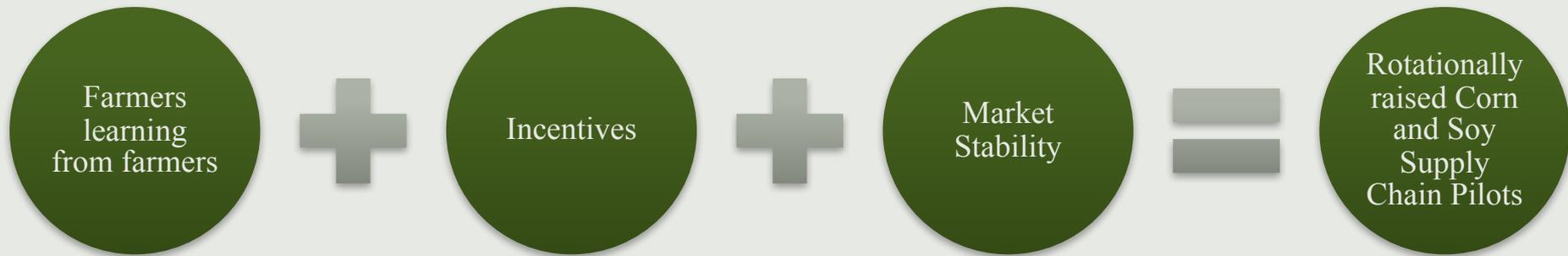
POLICY

- Third crop eligibility for cost share would provide additional incentives while market builds
- NRCS training on third crop benefits needed in order to better support farmers

CONSERVATION BENEFITS

- Early results with the CFT are good, but need full rotation data to establish baseline
- More on-farm and university trials with water quality and SOM measurement are needed to support CFT findings

Looking Ahead: 2017 Pilot



- PFI Farmer Support Model
- Annual PFI Small Grain Conference
- Rotation Research Network

- Cost Share
- Enterprise Budgets that show reduced inputs in corn and soy year + increased yields

- Small Grains Feed Analysis
- Sustainability metrics using CFT and testing FPC, RSET
- Collaboration from companies with interest in full rotation
- Tools for companies to communicate about the benefits of small grains
- Iowa Learning Journey for supply chain actors

- Reductions in inputs and resilient corn and soy yields
- Reductions in GHGs in livestock feed chains
- Reductions in GHGs in soy-oat-corn food ingredients
- Improved soil health and decreased nitrates and phosphorous in waterways



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The
WALTON FAMILY
FOUNDATION

THE MCKNIGHT FOUNDATION