



FARM FOUNDATION[®] FORUM

EMERGING CARBON MARKETS: ISSUES AND OPPORTUNITIES

MARCH 16, 2021



Today's webinar is made possible by a grant from
Farm Credit

#FarmFoundationForum





SHARI ROGGE-FIDLER
President and CEO
Farm Foundation

MEET FARM FOUNDATION

A 501(C)(3) NON-PROFIT AT THE INTERSECTION OF AGRICULTURE AND SOCIETY



Farm Foundation is an
ACCELERATOR
of practical solutions for agriculture.

We accelerate
PEOPLE AND IDEAS
into
ACTION.



OUR MISSION AND VISION GUIDE OUR WORK

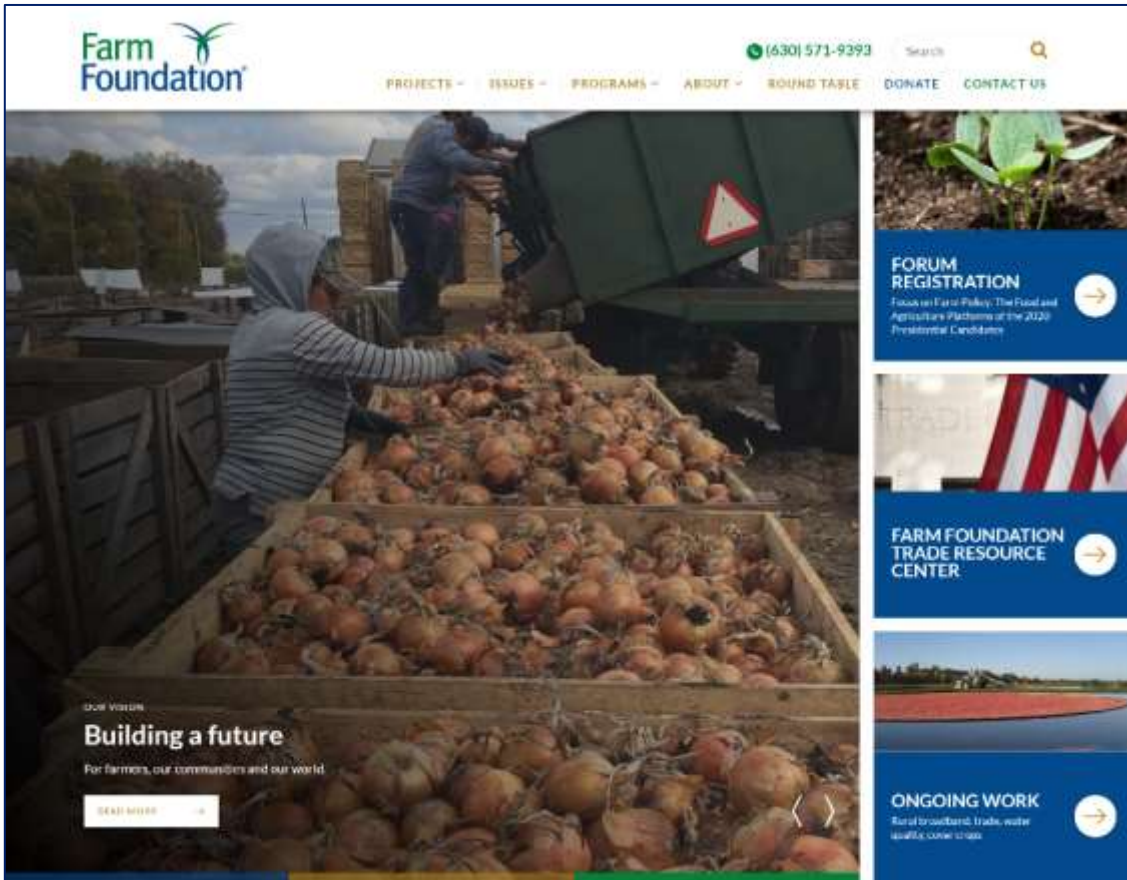
MISSION:

To **build** trust and understanding at the intersections of agriculture and society.

VISION:

To **build** a future for farmers, our communities and our world.

CONNECT WITH US!



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IMPORTANT NOTES

- Submit questions by clicking on the **Q&A Button** at the bottom of your screen.
- Please **include your name and company** so questions may be contextually understood.
- Due to **time limits**, we may not be able to ask all questions submitted.
- This Forum is being recorded and will be posted on our website at **farmfoundation.org**.
- If there are any **connectivity issues** during the Forum, we ask that you **stay on the Forum** as those generally rectify themselves after a few moments.
- Please take the **short survey** at the conclusion of the Forum.



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MATT SCHMITT

Senior Director of Commercial Carbon
Cargill

Carbon Markets **Emerging opportunities** **across agriculture**

Matt Schmitt
Commercial Carbon Senior Director

About Cargill

We aim to be the **most trusted partner** with the most sustainable supply chains for our customers.

155K

employees

70

countries in which
our employees work

155

years of experience

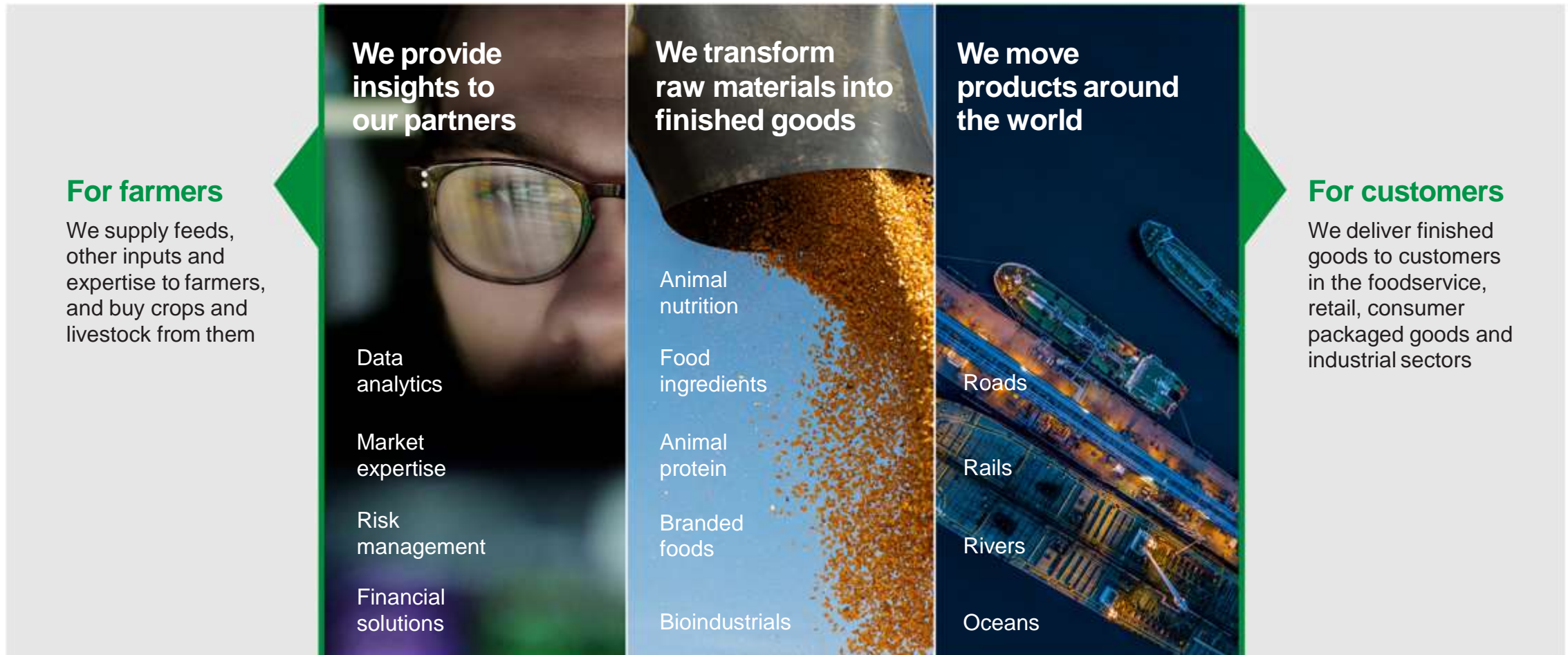
125+

countries where we
deliver to our customers

350

Cargill Cares Councils
supporting communities

Our business



A close-up photograph of a person's hands holding a large amount of dark brown soil. The soil is falling through the person's fingers, creating a dynamic, cascading effect. The person is wearing a blue and white plaid shirt. The background is a blurred green field under a blue sky with some clouds. The text "Agriculture is how" is overlaid in white, bold, sans-serif font across the center of the image.

Agriculture is how

Observations of needs

Whole-system thinking

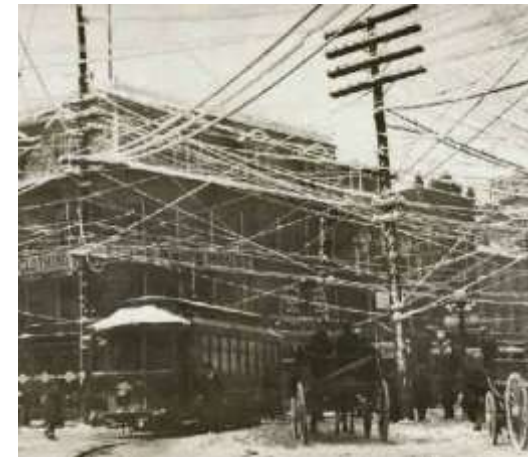
- Farmland is more than just agricultural production acres. Multi-dimensional impacts are possible when multi-dimensional connections are made.
- Our challenge is softening or even dissolving outmoded system boundaries and creating new connections with new boundaries

Producer-centric thinking

- Creating options for producers is essential. Options give flexibility, and flexibility allows for progress.
- Individual producers have their own best paths to balanced farming – environmental balance, economic balance, social balance, etc. Supportive self-discovery is crucial.

Business model evolution

- Traditional carbon pathways struggle to scale down to agricultural business owners.
- Agricultural carbon markets today are like early electricity markets: visible reality falls short of the conceivable potential.





Helping the world *thrive*



LISA STRECK

Carbon Business Model Grower Program Lead
Bayer Crop Science



Bayer

C A R B O N Initiative

Farmers' New Crop Opportunity

Farm Foundation
March 2021

RESTRICTED



C A R B O N Initiative

B A Y E R T O R E W A R D

G R O W E R S

to adopt climate-smart practices, sequestering carbon at scale and creating a revenue stream on-farm

ADOPTION

OF CLIMATE-SMART PRACTISES to reduce greenhouse gases and capture carbon in the soil



Cover crops



No-till



Precision nitrogen use



Crop rotation



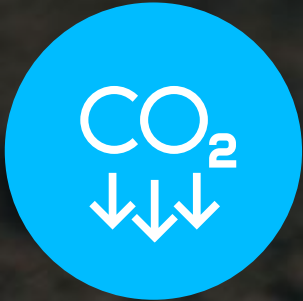
1/4

Agriculture has the potential to remove 1/4 of the worlds greenhouse gas emissions from the past 25 years



SOIL SEQUESTRATION

A UNIQUE OPPORTUNITY to turn productive acres into carbon sinks



Untapped Sequestration Potential



Improved Soil Health

Source: "Is carbon sequestration on farms actually working to fight climate change?" by Gabriel Popkin, Yale Environment 360



Bayer can change the way carbon is measured, verified and reported

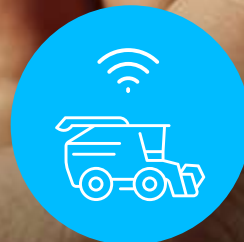
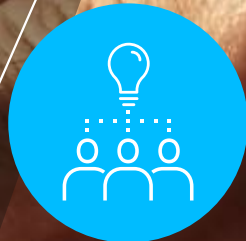
C A R B O N Initiative

Climate FieldView™ the most connected Digital Ag platform

Millions of acres already **connected** in Climate FieldView™ platform



Customers supported by field agronomy **team** who understand their challenges



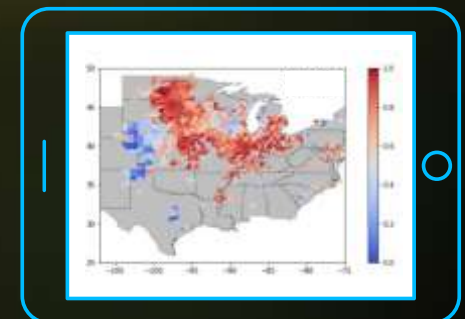
Machine **data stored** in the cloud

Quantification



CO₂e Total

Verification & Reporting



Crop Rotation by Field



C A R B O N Initiative

AS A

TRIPLE WIN



World and Society

Greenhouse
gas reduction



Farmer

Additional
revenue streams



Industry

More potential for
better yields and
predictable harvests



C A R B O N Initiative

bayercarbon.com/interest



KEN McCARTY

Co-Owner

McCarty Family Farms & MVP Dairy



McCarty[®]
Family Farms, LLC

KEN MCCARTY

McCarty Family Farms
MVP Dairy





McCarty[®]
Family Farms, LLC

BY THE NUMBERS

4 BROTHERS

Clay, Dave, Ken and Mike McCarty

5 DAIRY FARMS

Rexford, Bird City & Scott City, KS; Beaver City NE; Celina, OH

200 TEAM MEMBERS

Farm, processing plant, office, trucking, etc.

3,200 ACRES

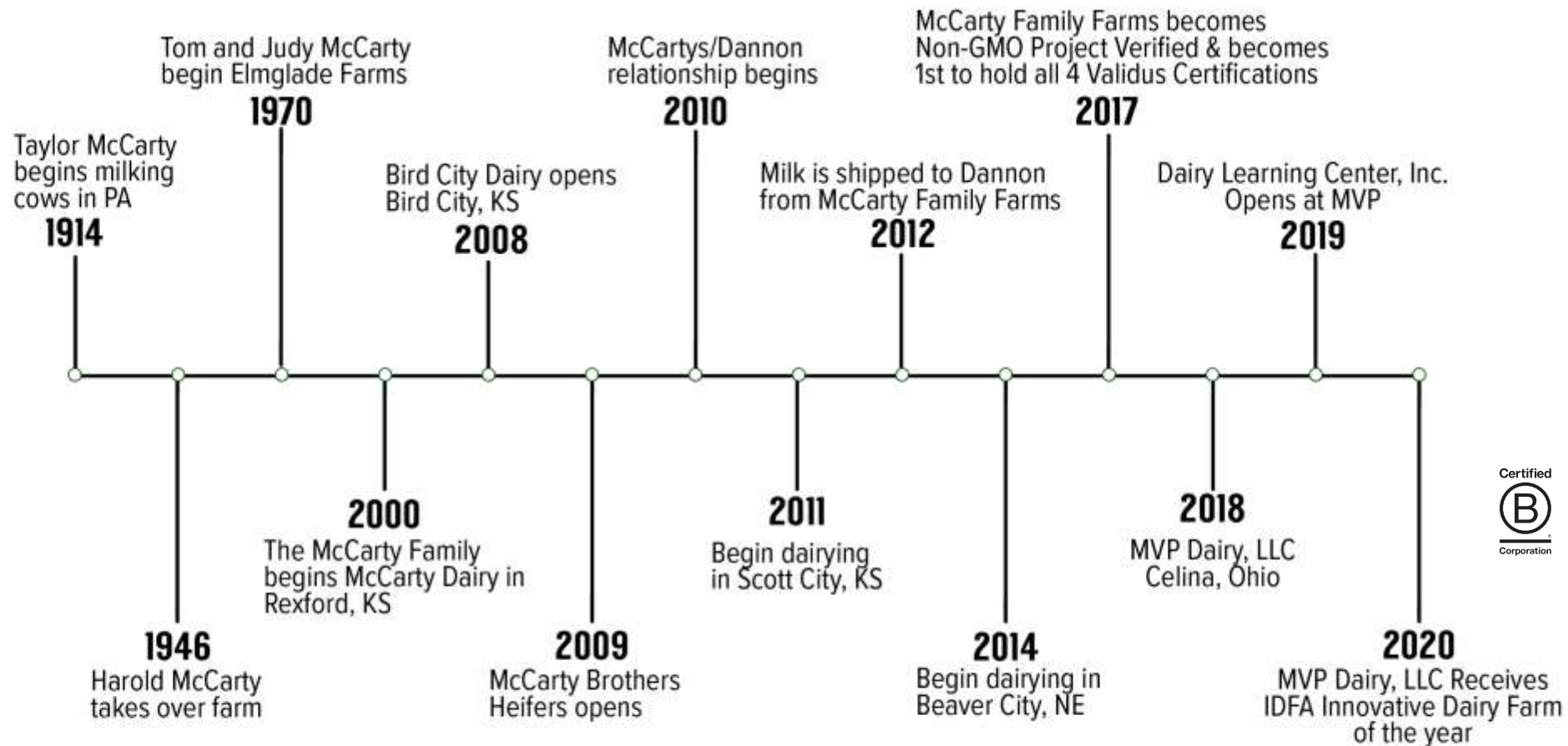
Corn, wheat, sorghum, oats, etc

28,500 COWS

13,000 milking, 2,000 dry, 13,500 youngstock
1,125,000 # milk/day



MCARTY FAMILY FARMS HISTORY





MVP DAIRY, LLC

- 6, 6-Row tunnel-ventilated freestall barns
- Built on 2% slope to utilize flush system/sand lane
- Manure separator
- 80 stall rotary parlor
- 100 lbs per day milk production
- Non-GMO Project verified

BEST PRACTICES

ANIMAL WELFARE

- Work with animal health experts
- Proper animal handling
- Utilize technologies
 - Cow Brushes
 - Activity Trackers
 - EID Tags
- 3rd Party Verifications



BEST PRACTICES

SUSTAINABILITY

- Cover Crops
- No-Till Farming
- Soil Moisture Probes
- Precision Irrigation
- Buffer Strips
- Biodiversity
- Wetlands
- Water Conservation



MEASURING IMPACT



ECOPRACTICES

ENVIRONMENTAL BENEFITS FROM WATER MANAGEMENT



*During 2017, McCarty Family Farms saved and reused:**



157 million gallons of water enabling the family to reuse it again and again.



This equates to **430,000 gallons every day.**



This is the amount of water in almost **4,300 average-sized bathtubs filled to the brim everyday.**



The farm's water conservation efforts **saved 342.9 million gallons of Ogallala Aquifer** ground water, which equates to **518 Olympic-sized swimming pools.**



26 bird boxes protect susceptible species



25 acres of native plants for biodiversity and pollinators

ANY QUESTIONS?



- Find us online at McCartyFamilyfarms.com or MVPDairyLLC.com
- Or follow us on    
- Or email me at Kmccarty@mccartyfamilyfarms.com

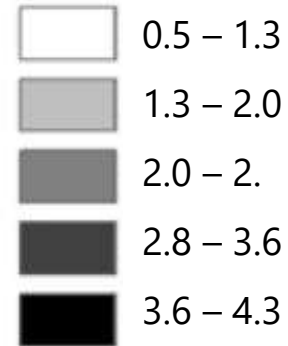
THANK YOU



CRISTINE MORGAN
Chief Scientific Officer
Soil Health Institute

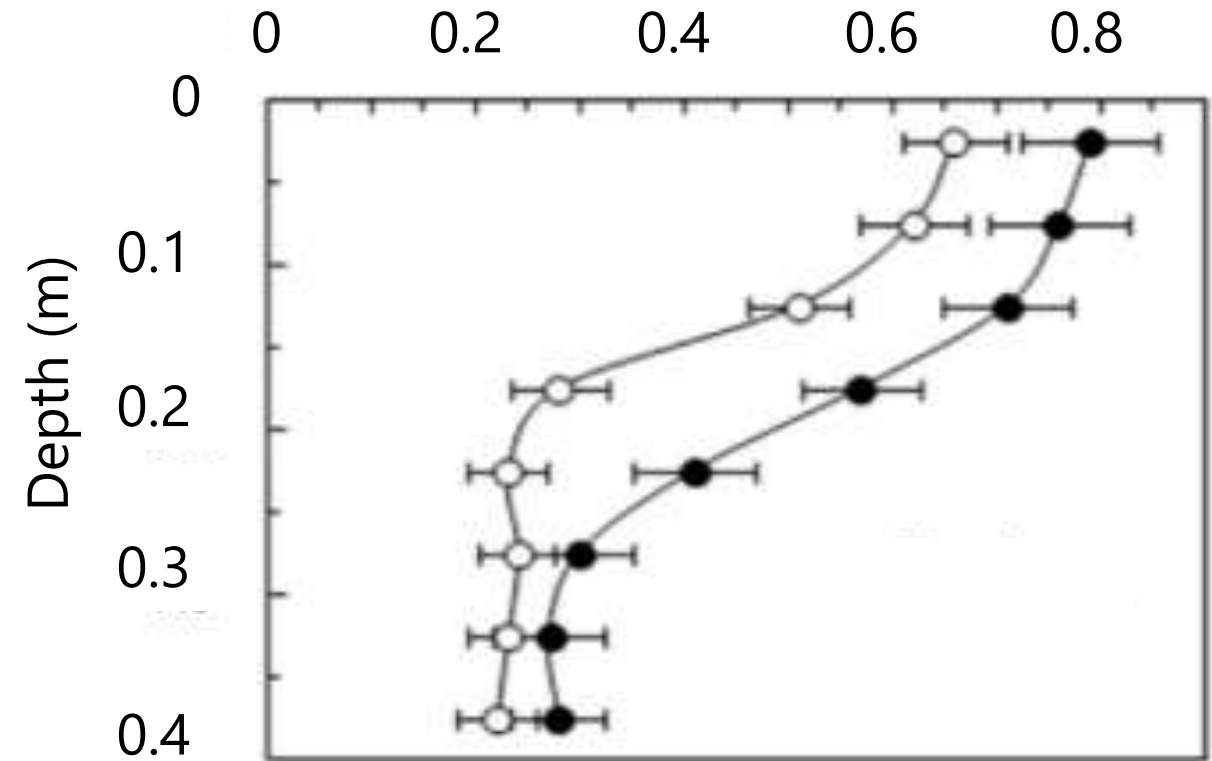
Soil Organic Carbon Varies in Space and with Depth

Organic Carbon (%) across 60 ha from 0-10 cm



Robinson and Metternicht, 2006

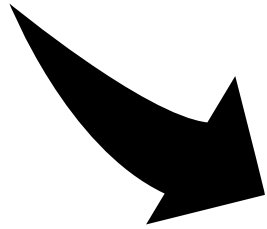
Organic Carbon (%) from 0 to 0.4 m depth



Singh et al., 2014

Requirements for Soil Carbon Stock Sampling

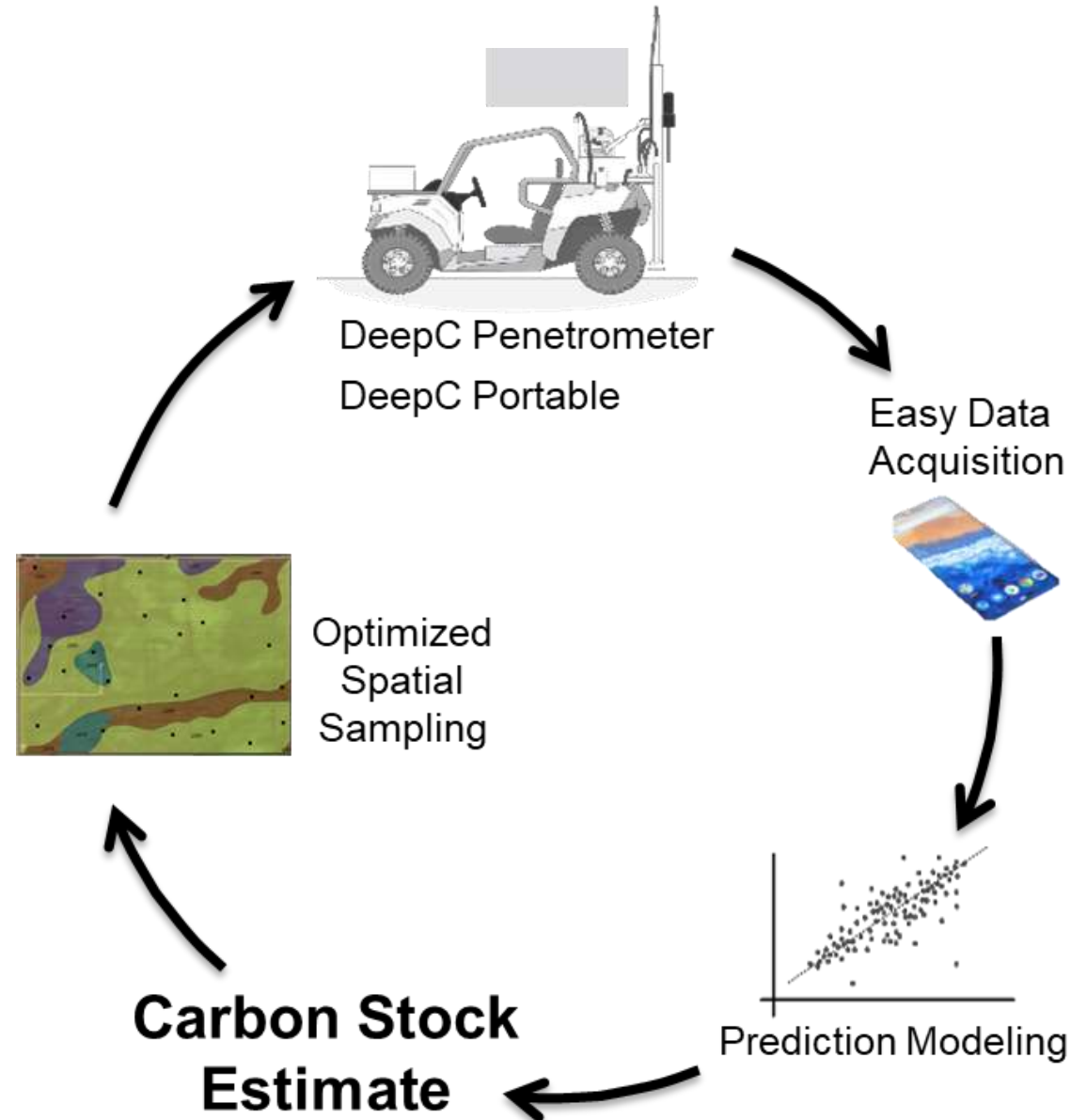
- Measure both carbon concentration and bulk density
- Many samples across a landscape
- Samples to 30 cm or deeper



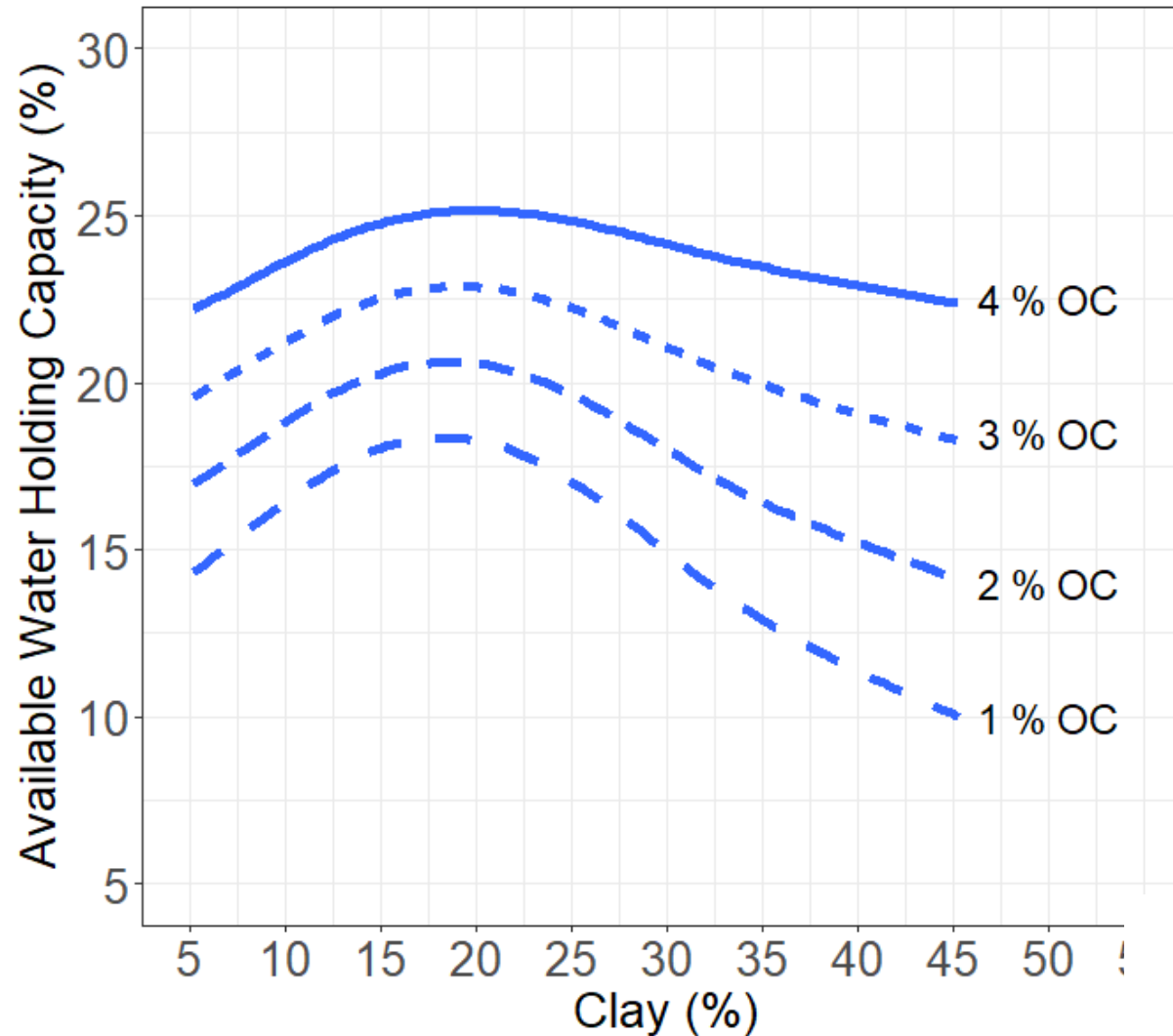
- 1. Time**
- 2. Transportation**
- 3. Cost**



DeepC: Rapid In-Field Carbon Stock Measurement



Increasing Soil Organic Carbon Can Improve Agricultural Resilience



Summary

1. Better measurement technologies can decrease the cost of on-farm measurement and validation
2. Quantifying on farm and off farm benefits of soil organic carbon can catalyze management changes



ALDYEN DONNELLY

Co-Founder & Director of Carbon Economics
Nori, Inc.



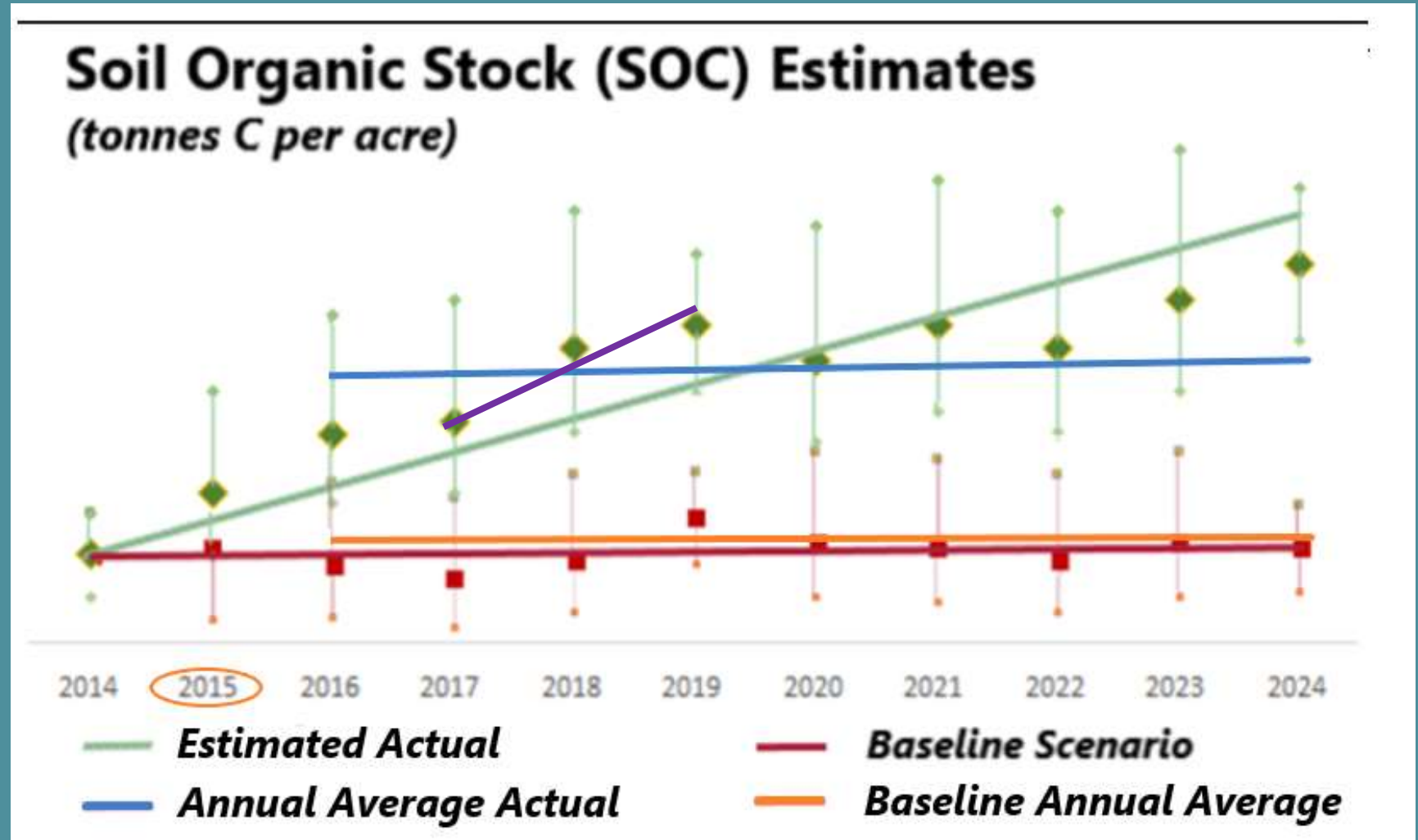
Qs Farmers Should Ask

- How much is this going to cost?
 - Do I own my Project and/or any credits issued to it?
 - Am I giving away my private farm operating data and what can the Aggregator, Registry operator or Market Administrator do with it?
 - Who sets the prices my credits sell for?
 - If a Buyer pays US\$20/TCO2e for my credits, how much do I receive out of the amount paid, how fast?
 - Do I have to keep reporting farm operating data after the Aggregator or credit Buyers stop paying for credits? If so, for how long?
 - Am I contractually bound to specific soil treatment, cropping and/or livestock management practices, or not?
 - Does a lien attach to my property?
- ... and more ...*



Why Interpreting Soil Sample Test Results Can Be Difficult and Confusing

- If initial credit quantification reflects the trend defined by sample test results for 2017-2019 (— line), too many credits will be issued.
- Subsequent verification events will suggest C losses which did not actually occur.





THANK YOU!

JOIN US FOR OUR NEXT EVENTS:

- **Dialogues on Trade and Climate Change**
April 7 & 9, 2021
- **Understanding the EU Farm to Fork Strategy and Its Implications for U.S. Agriculture**
Farm Foundation® Forum
April 27, 2021

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