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!

farmfoundation.org

#FarmFoundationForum
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](http://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
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

For farmers
We supply feeds, other inputs and expertise to farmers, and buy crops and livestock from them.

Data analytics
Market expertise
Risk management
Financial solutions

For customers
We deliver finished goods to customers in the foodservice, retail, consumer packaged goods and industrial sectors.

We provide insights to our partners

We transform raw materials into finished goods

Animal nutrition
Food ingredients
Animal protein
Branded foods
Bioindustrials

We move products around the world

Rivers
R series
Rivers
Oceans
Roads
Rails
Oceans

Financial solutions
Sustainability and corporate responsibility
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.
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
to adopt climate-smart practices, sequestering carbon at scale and creating a revenue stream on-farm
Adoption of climate-smart practices to reduce greenhouse gases and capture carbon in the soil

- Cover crops
- No-till
- Precision nitrogen use
- Crop rotation

Agriculture has the potential to remove \( \frac{1}{4} \) of the world's greenhouse gas emissions from the past 25 years.

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

**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

/// Bayer Carbon Initiative /// 2020

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RESTRICTED
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
CARBON Initiative

bayercarbon.com/interest
KEN McCARTY
Co-Owner
McCarty Family Farms & MVP Dairy

#FarmFoundationForum
KEN MCCARTY
McCarty Family Farms
MVP Dairy
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
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
ANIMAL WELFARE

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

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

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 🐱‍🐉チャンネル | 🎥 | 🌟
• 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

- 0.5 – 1.3
- 1.3 – 2.0
- 2.0 – 2.8
- 2.8 – 3.6
- 3.6 – 4.3

Organic Carbon (%) from 0 to 0.4 m depth

Robinson and Metternicht, 2006

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

- **DeepC Penetrometer**
- **DeepC Portable**
- **Easy Data Acquisition**
- **Optimized Spatial Sampling**
- **Carbon Stock Estimate**
- **Prediction Modeling**
Increasing Soil Organic Carbon Can Improve Agricultural Resilience
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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