FARM FOUNDATION® FORUM

SOLVING THE BARRIERS TO AGRICULTURAL CARBON MARKETS

APRIL 12, 2022

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

#FarmFoundationForum

Farm Foundation
Accelerating people & ideas

SHARI ROGGE-FIDLER

President & CEO
Farm Foundation

Farm Foundation®
Accelerating people & ideas

MEET FARM FOUNDATION

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

Farm Foundation
Accelerating people & ideas

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.

Farm Foundation®
Accelerating people & ideas

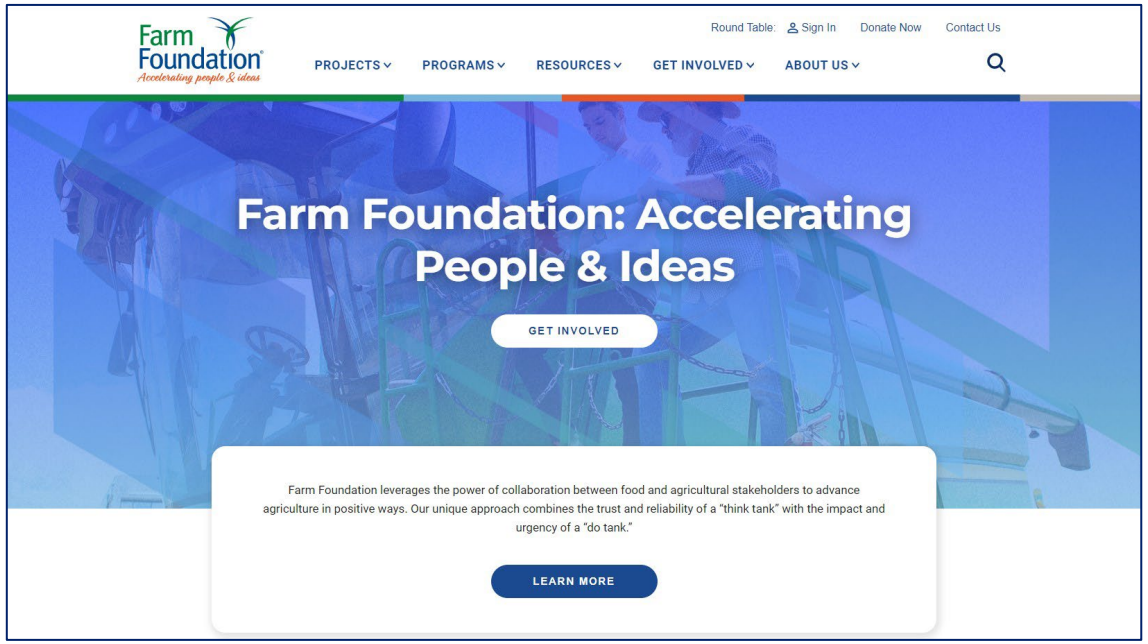
BECOME A FRIEND OF FARM FOUNDATION

See link in chat function

- Donate to Farm Foundation to support our mission
- Receive exclusive benefits and curated content
- Help us continue to provide valuable content like today's Forum

Farm Foundation
Accelerating people & ideas

CONNECT & COLLABORATE WITH US!



farmfoundation.org

Connect with us on social media:

@farmfoundation

@thefarmfoundation

Farm Foundation

@thefarmfoundation

#FarmFoundationForum

Farm Foundation
Accelerating people & ideas

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** as well as the Farm Foundation **YouTube** channel.
- Please take the **short survey** at the conclusion of the Forum.

#FarmFoundationForum

Farm Foundation®
Accelerating people & ideas

FARM FOUNDATION® FORUM

SOLVING THE BARRIERS TO AGRICULTURAL CARBON MARKETS

APRIL 12, 2022

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

#FarmFoundationForum

Farm Foundation
Accelerating people & ideas

DR. GARTH BOYD

Moderator

Partner

Context Network

Farm Foundation
Accelerating people & ideas


Farm
Foundation®
Accelerating people & ideas

SHELBY SWAIN MYERS

Economist

American Farm Bureau Federation

Farm Foundation
Accelerating people & ideas

Solving the Barriers to Agricultural Carbon Markets

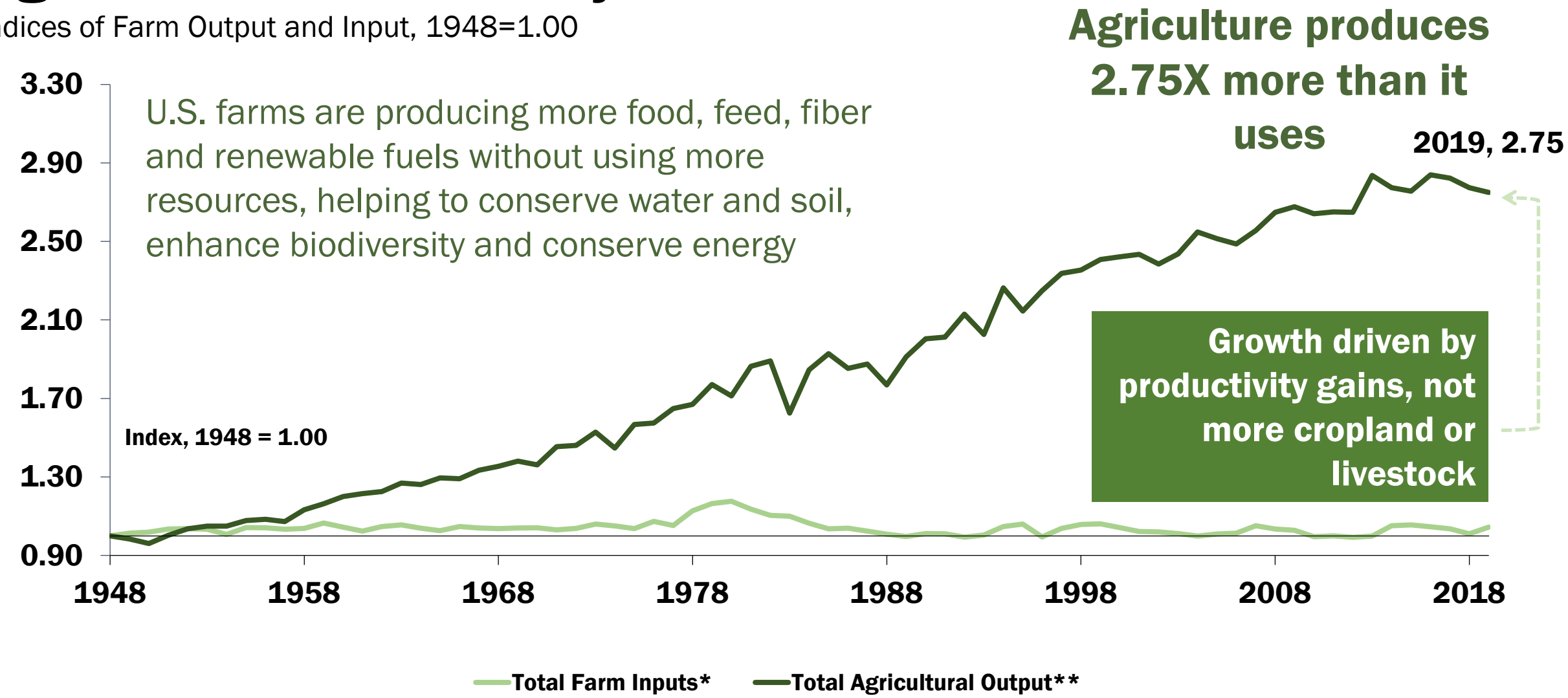
The Growers' Perspective

Shelby Swain Myers
Economist
shelbym@fb.org
(317) 431-2127

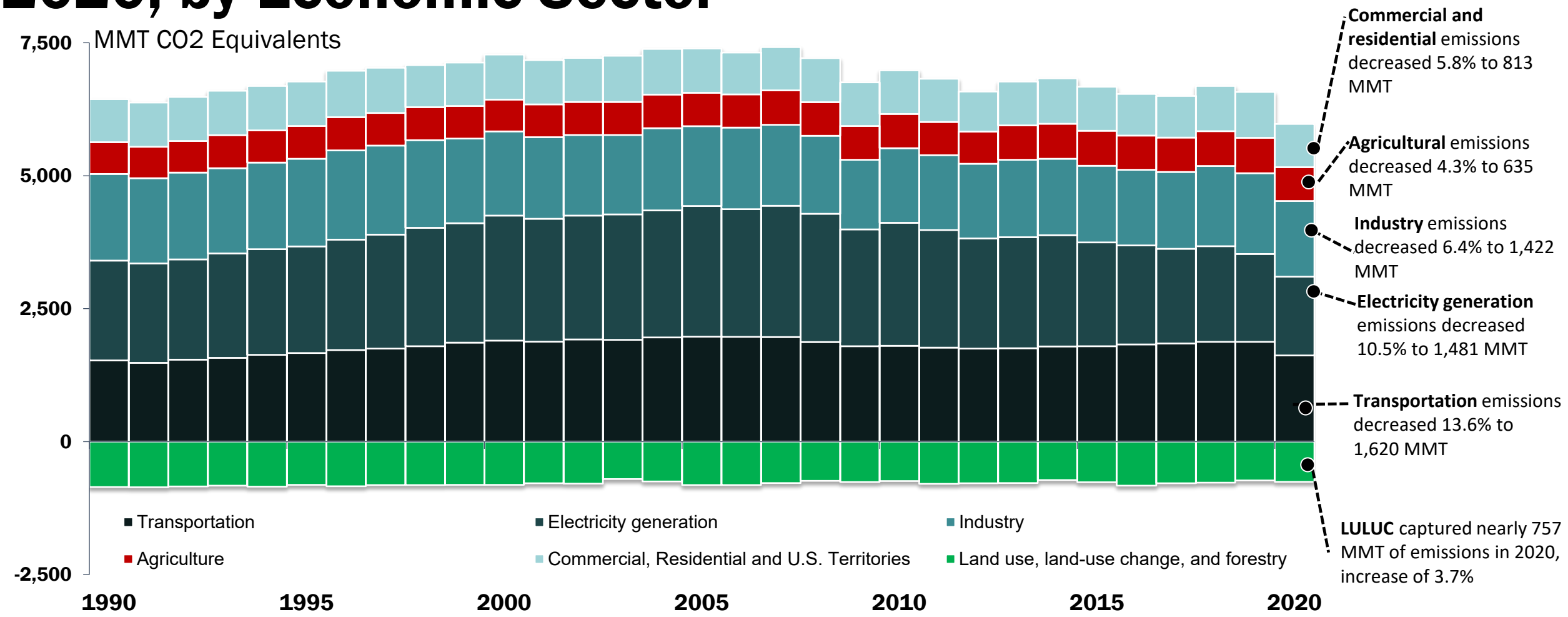
Photo Credit: Getty Images

Agriculture Productivity in the U.S.

Indices of Farm Output and Input, 1948=1.00



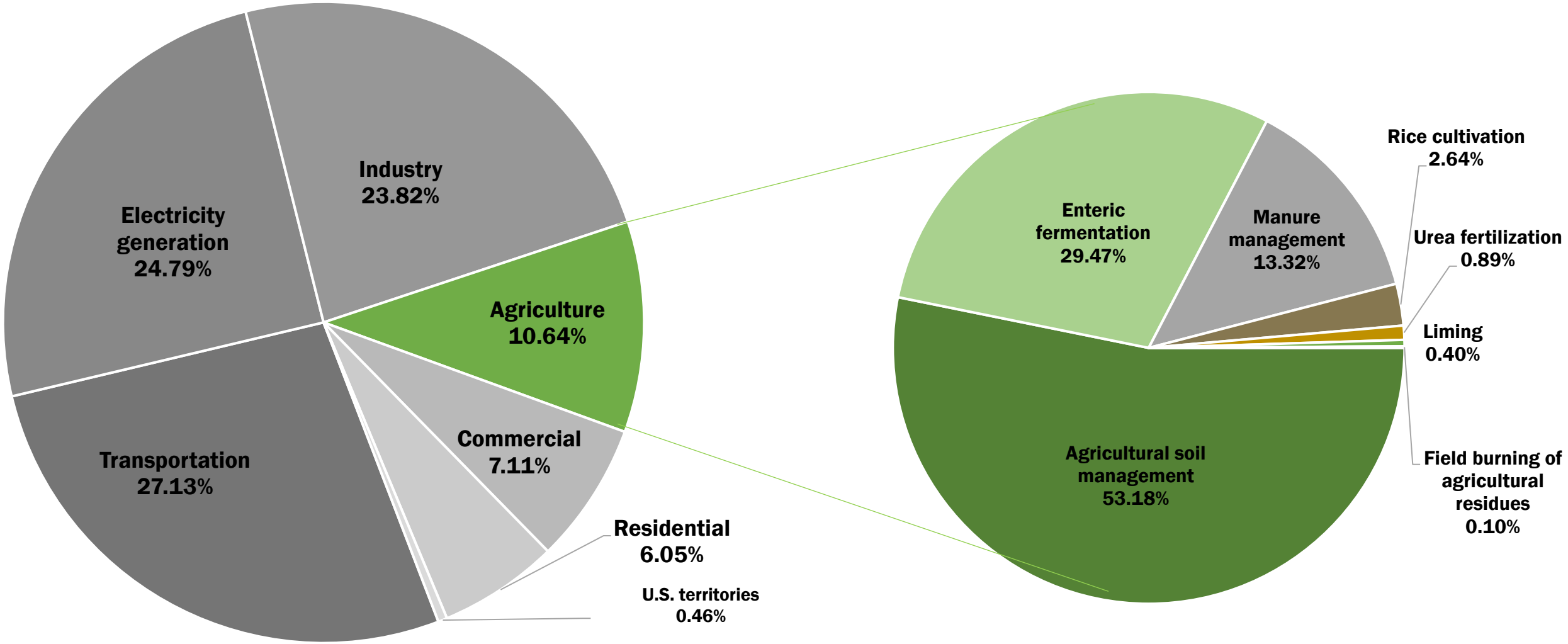
Total U.S. Greenhouse Gas Emissions Down 10.7% in 2020, by Economic Sector



Source: Environmental Protection Agency, Farm Bureau Calculations

U.S. and Agricultural Emissions By Source, 2020

Agriculture continues to be just 10% of U.S. Greenhouse Gas Emissions



AMERICAN FARM BUREAU FEDERATION®

www.fb.org

Source: Environmental Protection Agency, Farm Bureau Calculations

BACKGROUND

- These are voluntary, incentive-based national markets designed to sell agriculture ecosystem asset credits
- Farmers who want to earn money selling credits on these new markets opt into data monitoring and measurement
- Payments are typically based on outcomes such as increases in soil carbon or improved water quality or practice
- Need to certify, quantify, and verify these outcomes into credits

SUSTAINABILITY MARKETS' REVENUE POTENTIAL

Changes to Crop Systems Could Generate Additional Revenue

Image credit: Pixabay_field

Growers Paid for Credits

<u>Quantified, Verified Assets</u>

Soil Carbon	Net GHGs
Water Quality	Water Quantity
Nutrients	Etc.

Image credit: Pixabay_prices

<u>Producer Enrollment</u>

NRCS practices

Data monitoring/measurement

Long-term contract

<u>Credit Buyers</u>

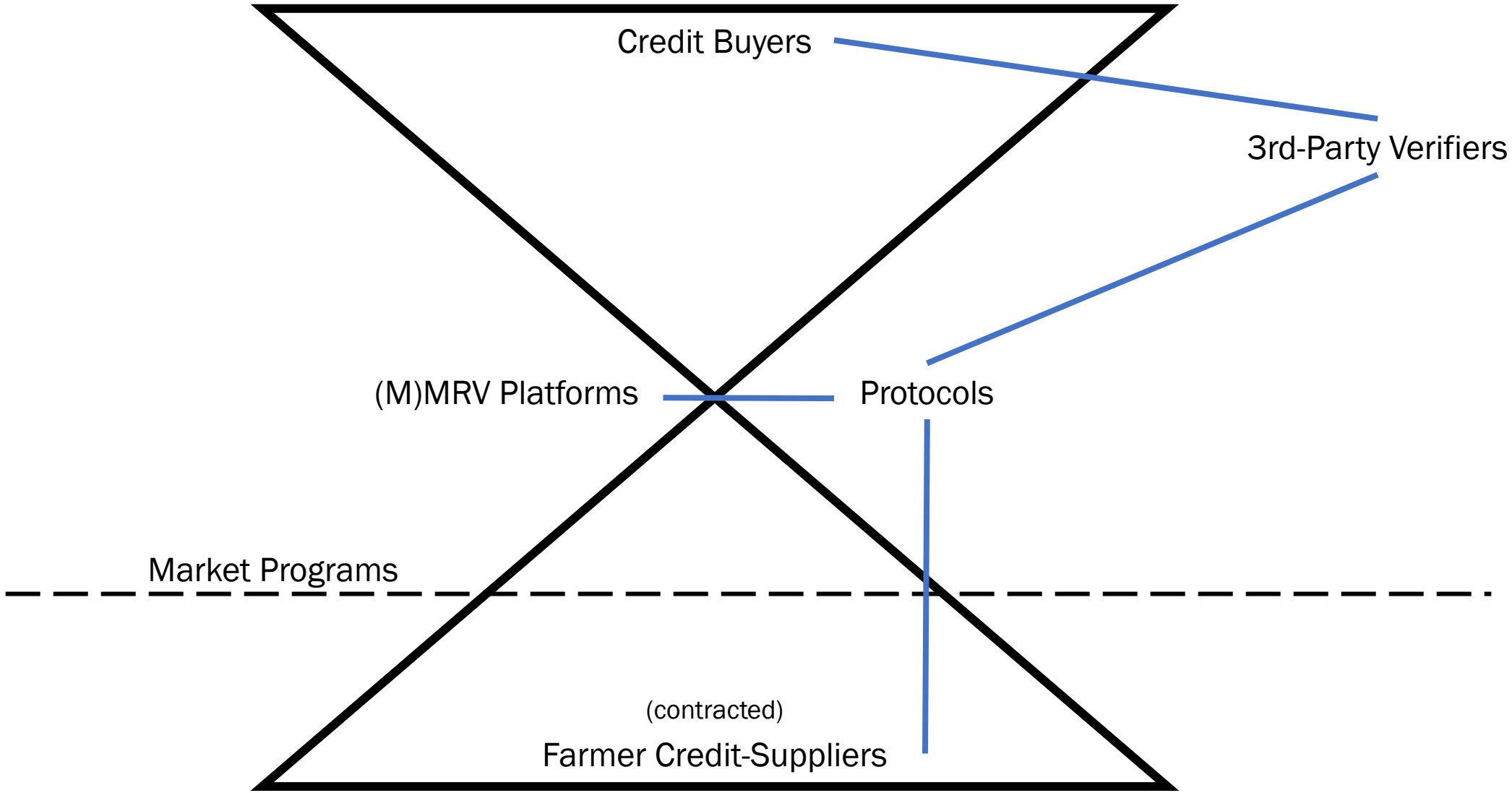
Meeting sustainability commitments

Compliance standards

Image credit: GerdAltmann_sustainability

Source: Farm Bureau Compilation

EMERGING INDUSTRY (NOT A MARKET, YET)



Source: Farm Bureau

SOME CONSERVATION PRACTICES

- Conservation Cover
- Cover Crops
- Crop Rotation
- Livestock Rotation
- No-till/ Strip-till
- Anaerobic Digesters
- Nutrient Management
- Buffer Strips
- Tree/Shrub Establishment

PURPOSE

- Promote healthy soils
- Maintain ecosystem functions
- Efforts in managing GHG emissions
  - Reduce new emissions
  - Remove past emissions
- Create impacts that benefit society
  - Improved water quality
  - Water use conservation
  - Biodiversity
  - Pollinator and wildlife habitat
- Diversified revenue streams

QUESTIONS FROM GROWERS:

- How do we overcome barriers of entry?
  - Verification
  - Additionality
  - Early-adopters
  - Financial barriers
  - Technical support
  - Education
- How will farmers be paid?
- How will farmer data be protected?
- Who will regulate these?
- How long is a contract?
- What do contract terms actually mean?
- What is my liability/access?
- What's realistic to expect?
- Who can I trust?
- What about x, y, z?

AFBF Market Intel

https://www.fb.org/market-intel

Sustainability Markets, Part 1: Agricultural Ecosystem Credit Markets – The Primer

Sustainability Markets, Part 2: Common Land-Use Practices Under Consideration for Conservation Adoption

Credit: Preston Keres, USDA

Sustainability Markets, Part 3: Barriers to Participation in Ag Ecosystem Credit Markets

Sustainability Markets, Part 4: Is Carbon a Commodity?

Sustainability Markets, Part 5: Good Business Practices for Farmers Participating in Agriculture Ecosystem Credit Markets

Credit: iStockPhoto

Shelby Swain Myers
Economist
shelbym@fb.org
(317) 431-2127


Farm
Foundation®
Accelerating people & ideas

DR. ALEJANDRO PLASTINA

Economics Associate Professor/Extension Economist
Iowa State University

Farm Foundation
Accelerating people & ideas

Challenges to the Ag Carbon Industry

Dr. Alejandro Plastina
Associate Professor of Economics

2021 Farm Foundation Agricultural Economics Fellow

Carbon Credit

- A tradable asset (like a certificate or permit) that gives the buyer the right to offset the emission of GHGs into the atmosphere
- Carbon credits are created when entities reduce their carbon emissions or remove carbon from the atmosphere (compared to a set baseline)
- Typically, each credit represents one metric ton (2,204 pounds) of carbon dioxide or an equivalent amount of another GHG emissions removed or avoided

Challenges to the Ag Carbon Industry

Credit Buyers seek:

a. **Additionality**: pay only for new changes in ag practices
b. **Permanence**: long-term removal/avoidance of GHG emissions
c. **Realness**: actual and quantifiable amounts of GHG emission removal/avoidance
d. **Leakage avoidance**: prevent increases in GHG emissions outside of the project area in response to decreases in production within the project area

❖ Challenge: the **quality** of a carbon credit cannot be ascertained by consumers even after consumption (“credence good”)

→ **Certification** to verify claims on carbon credits

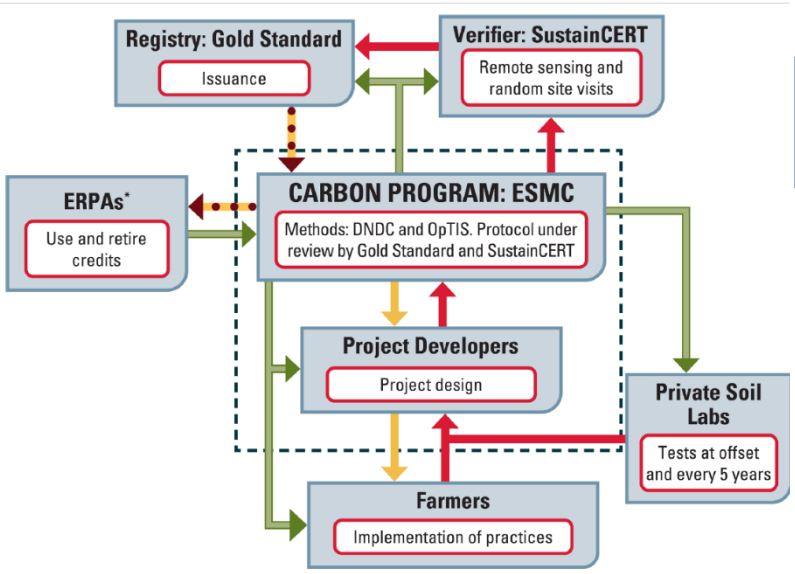
Measuring, Reporting, and Verification (MRV) Systems

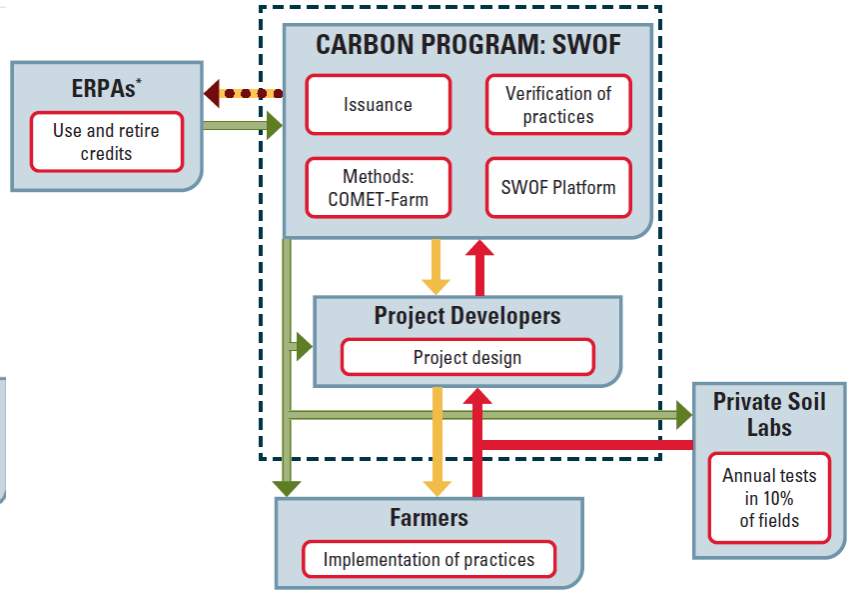
- Robust MRV systems are key to convince buyers that the implemented changes in agricultural practices actually removed carbon from the atmosphere or avoided carbon emissions

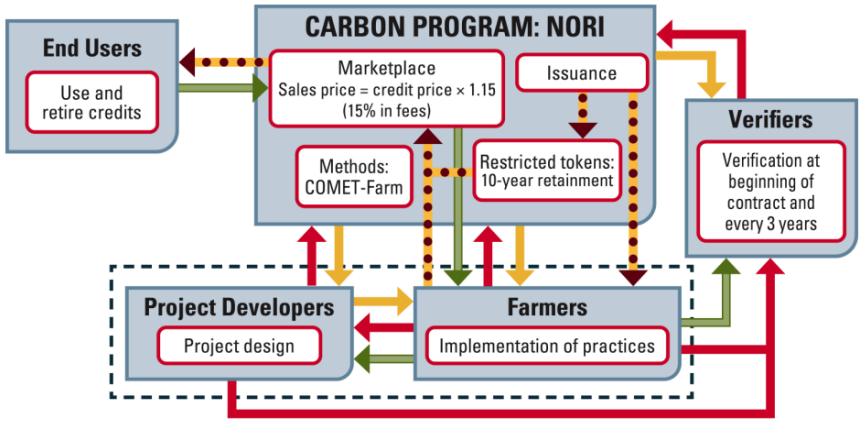
- A robust MRV system is a necessary condition for the development of a strong ag carbon market

Challenges to the Ag Carbon Industry

- Lack of consistent and **uniform guidelines** across MRV systems→ high "search costs" for credit buyers







https://www.extension.iastate.edu/agdm/crops/pdf/a1-77.pdf

- Low degree of **independence** between verifiers and carbon programs → could undermine buyers' trust in certification

Challenges to the Ag Carbon Industry

- Pledges of carbon neutrality place the target date a decade or more into the future → disconnect between long-term plans and short-, medium-term demand for carbon credits

Microsoft will be carbon negative by 2030

Jan 16, 2020 | Brad Smith - President & Vice Chair

Sustainability

Smithfield Foods to Become Carbon Negative by 2030

Company commits to bold climate action with industry-leading pledge

Wednesday, December 15, 2021 5:05 PM

Kraft Heinz Cements Climate Ambition, Commits to Carbon Neutrality by 2050

FORD COMMITS TO CARBON NEUTRALITY BY 2050

FORD MOTOR COMPANY INTENDS TO ACHIEVE CARBON NEUTRALITY GLOBALLY BY 2050, WHILE SETTING INTERIM TARGETS TO MORE URGENTLY ADDRESS CLIMATE CHANGE CHALLENGES.

BUSINESS

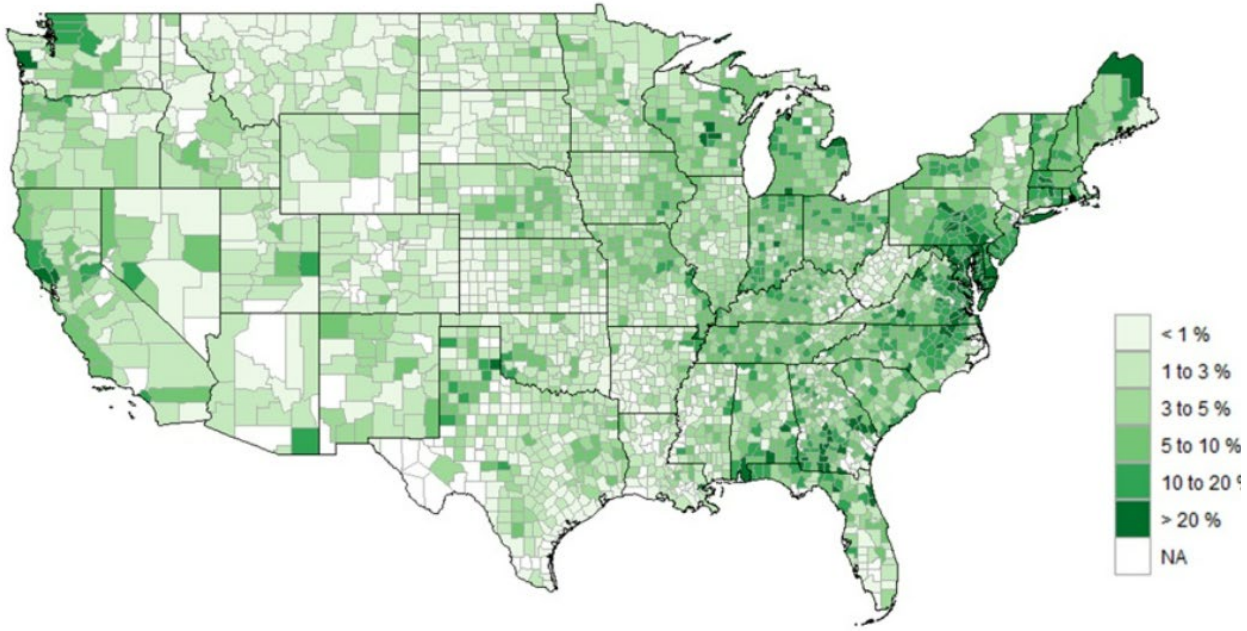
Exxon Pledges to Reduce Carbon Emissions From Operations to 'Net Zero'

Oil giant said it would zero out emissions from assets it operates by 2050, but didn't commit to reducing emissions from use of its fuels

Challenges to the Ag Carbon Industry

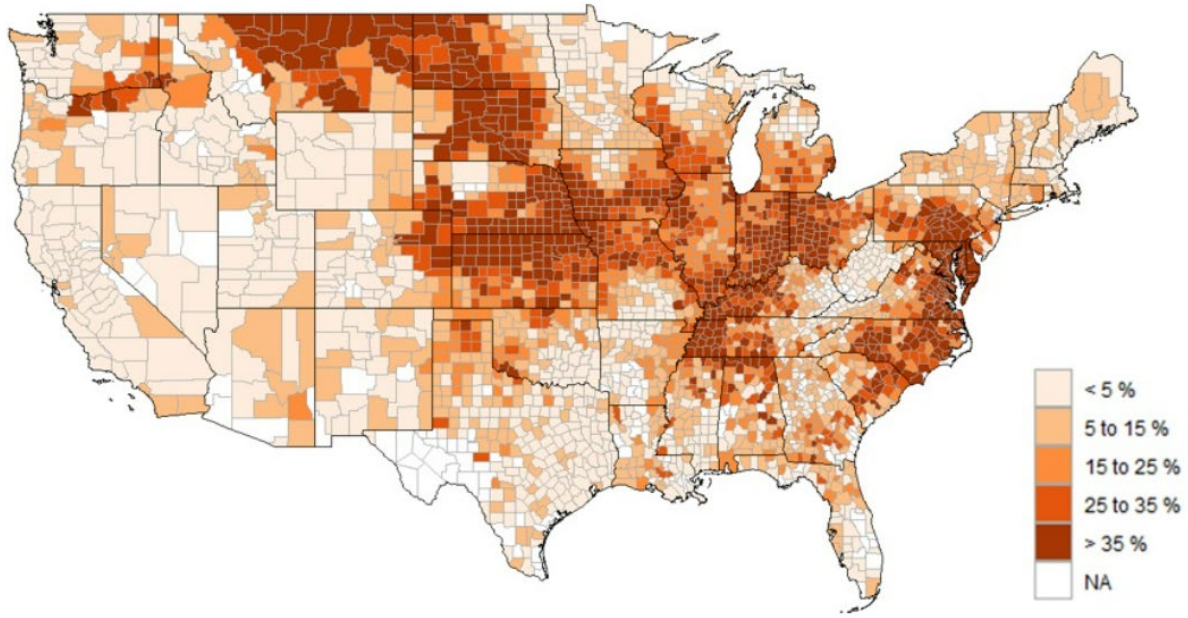
- Changing farming practices is **costly** to farmers

Figure 1. Cover Crop Area by County



Panel A. Cover Crop Adoption Rate by County, 2017

Figure 2. No-Till Area by County



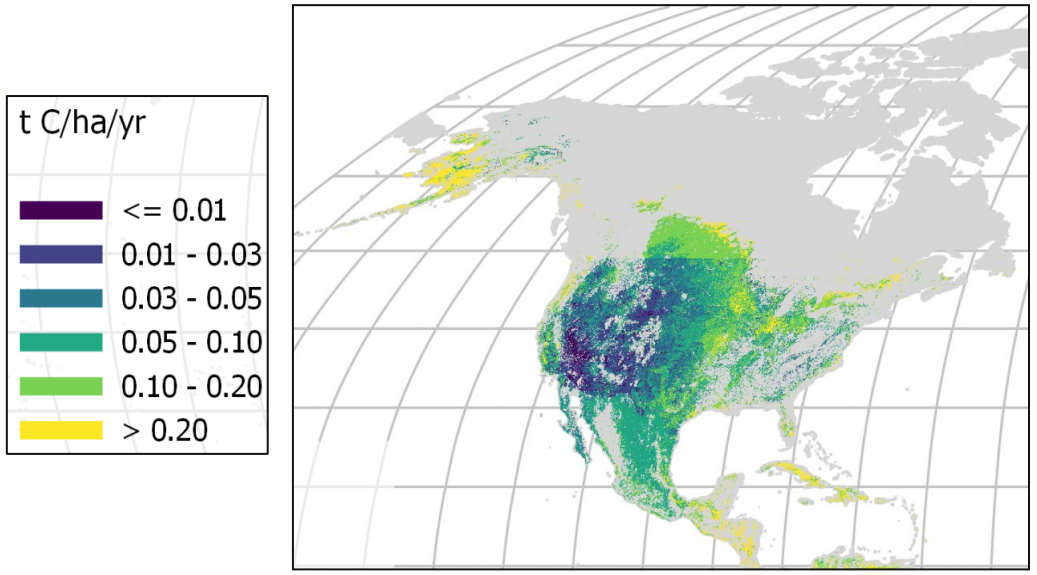
Panel A. No-Till Adoption Rate by County, 2017

1st Quarter 2022 | Choices Magazine Online

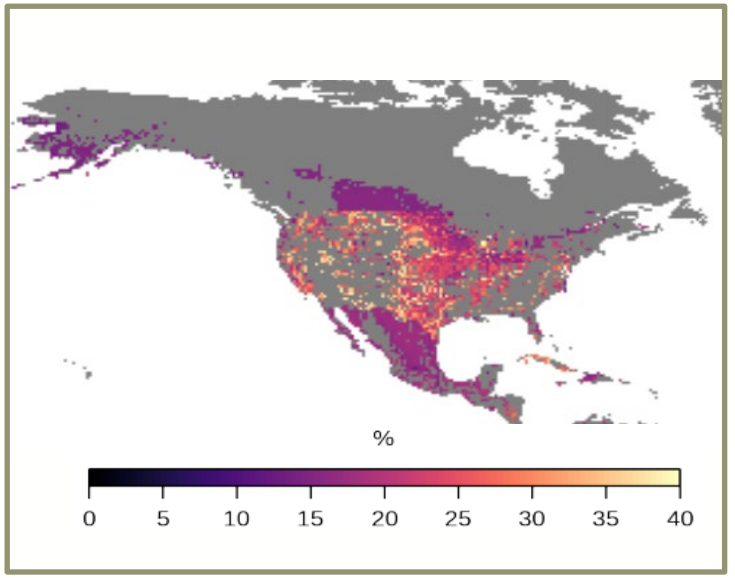
Challenges to the Ag Carbon Industry

❖ **Science Gap 1:** Uncertainty in the **projected** volume of carbon credits that can be produced by a farmer

Relative Soil Organic Carbon Sequestration Rates



Uncertainty in Estimation



Global Soil Organic Carbon Sequestration Potential Map – GSOCseq v.1.1 (fao.org)

→ projected vs. actual volume of credits: weather, timeliness of practices, weed pressure, etc.

Challenges to the Ag Carbon Industry

- **Science Gap 2:** Measuring the **actual** volume of carbon removed/avoided in a farm is challenging and costly:
  - Soil tests can produce more accurate measurements than remote sensing in some cases, but they are cost-prohibitive at large scale
  - Remote sensing technologies could produce very uncertain estimates of actual changes in GHG emissions at farm level
  - Lack of scientific consensus on linkages between soil dynamics, agricultural practices, and GHG dynamics at farm level

Challenges to the Ag Carbon Industry

- **Science Gap 3:** Impossible to **compare** carbon credits generated by one change in practices in one farm across carbon programs

Carbon Program	Carbon Model
CIBO Impact	SALUS (system approach to land use sustainability)
Nori; Soil and Water Outcomes Fund	COMET-farm
Ecosystem Services Market Consortium (ESMC)	DNDC (DeNitrification-DeComposition) and OpTIS (operational tillage information system)
Agoro; Indigo; Gradable	Own proprietary models

→ What is the most suitable carbon program for a farm?

Challenges to the Ag Carbon Industry

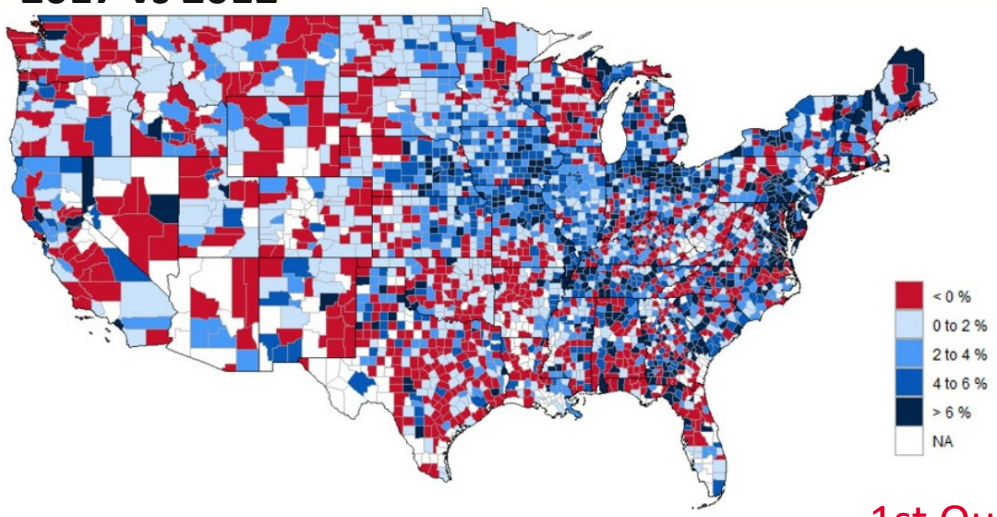
- Evolution of carbon prices? → **Revenue uncertainty** for participating farmers

EUA Futures contract Dec 22
(Euros per metric ton of carbon offsets, theice.com)

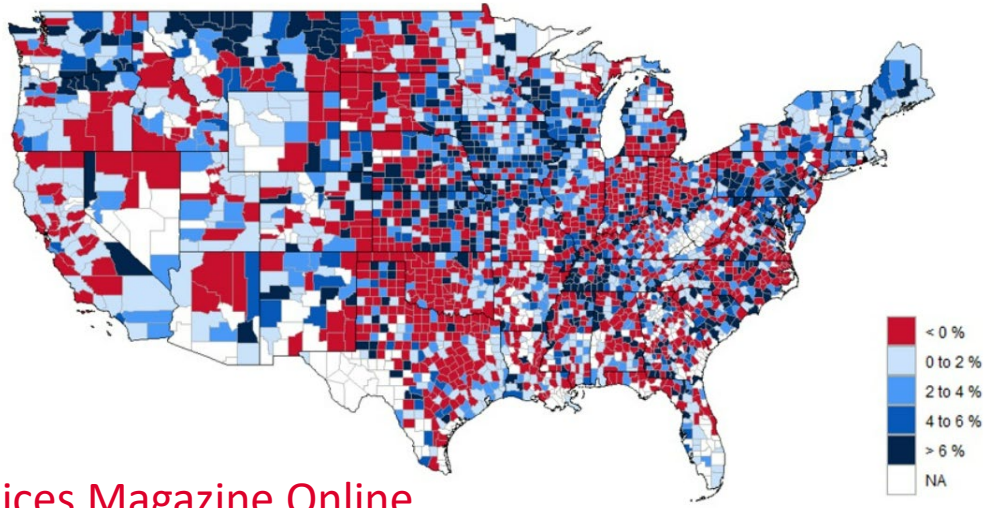
Challenges to the Ag Carbon Industry

❖ **Disadoption** of conservation practices and carbon **reversals**

% Change in Cover Crop Adoption Rate by County: 2017 vs 2012



% Change in No-Till Adoption Rate by County: 2017 vs 2012

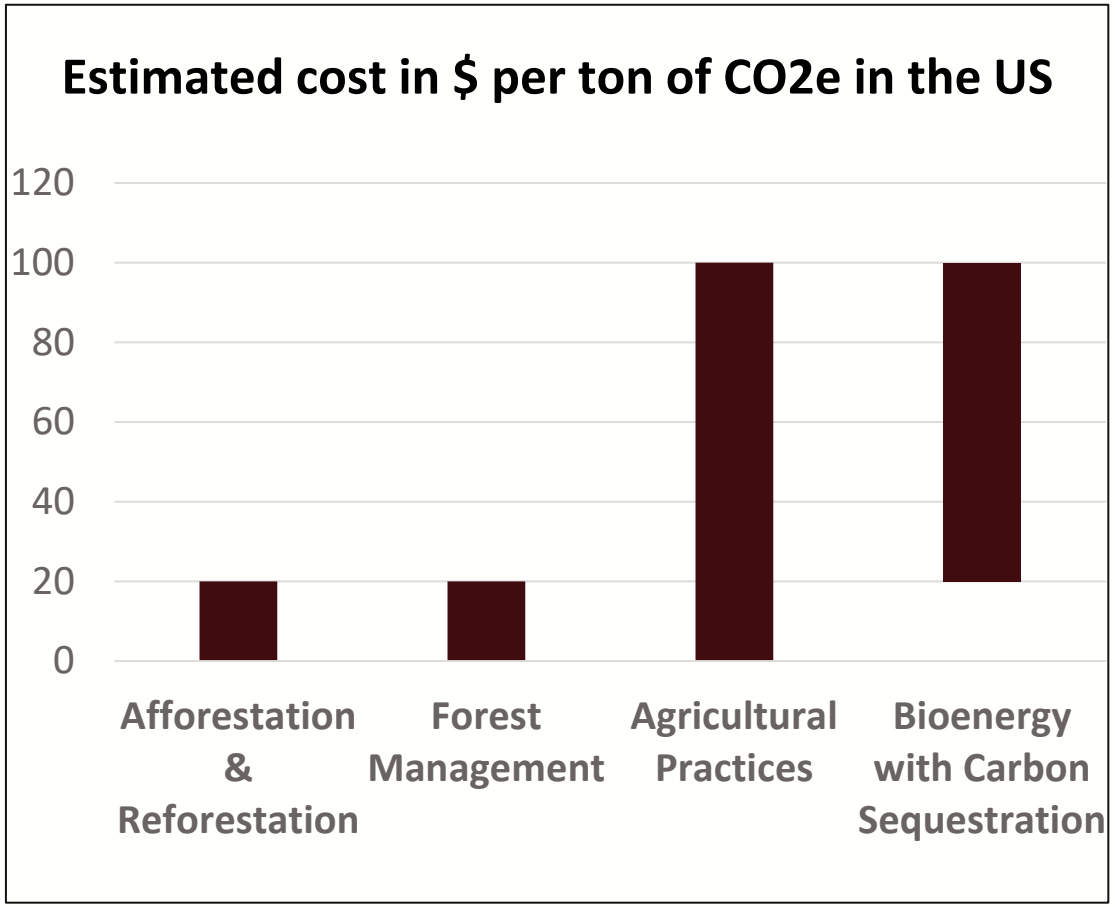


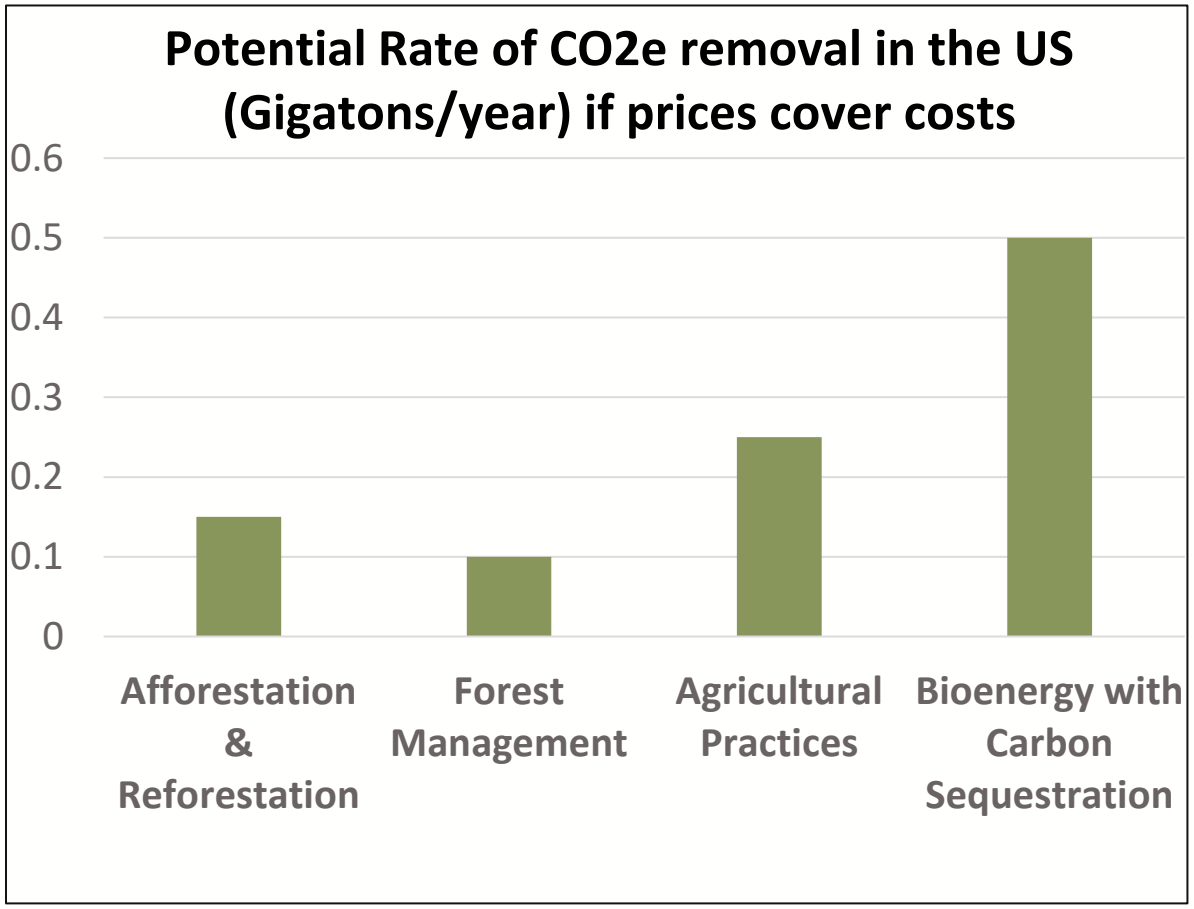
1st Quarter 2022 | Choices Magazine Online

- Penalties to disadopting farmers vary across programs
- Use of carbon credits in buffer to offset carbon reversals?
- Overall industry credibility?

Challenges to the Ag Carbon Industry

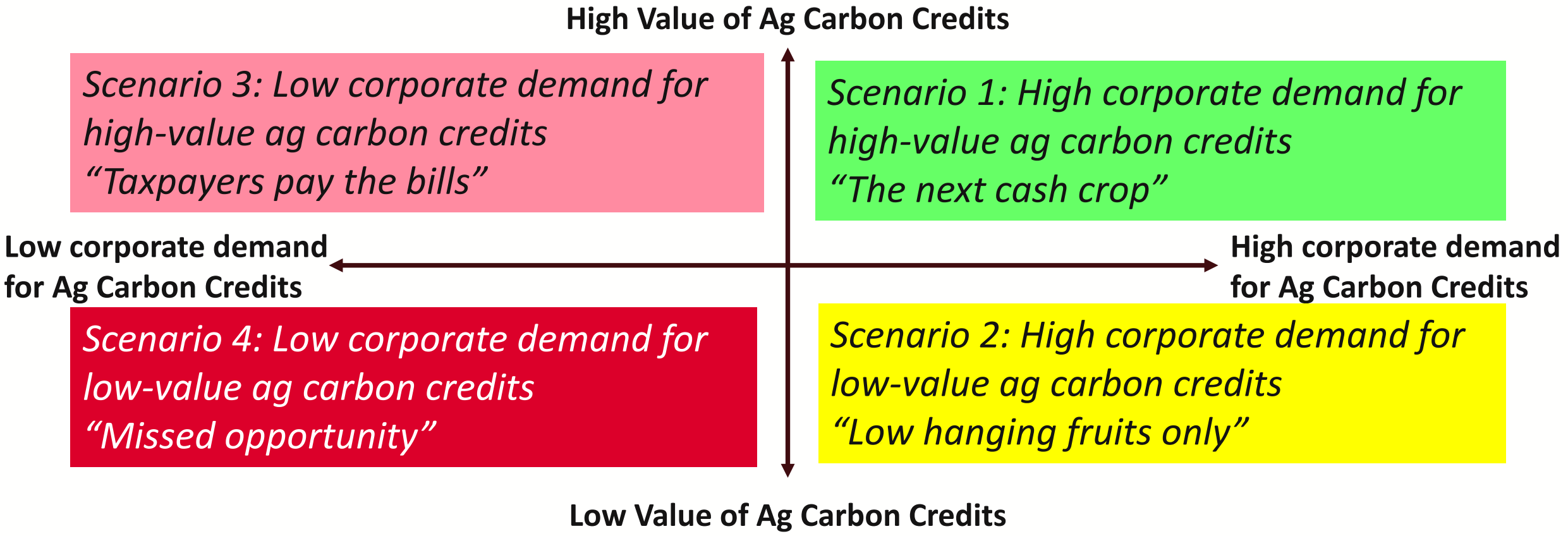
- Competition in supply of carbon credits from forestry, industrial carbon sequestration, and international agriculture





National Academy of Sciences, Engineering, and Medicine (2019)

Possible Scenarios for Ag Carbon



Wongpiyabovorn, Plastina, & Crespi. 2022.
https://doi.org/10.1002/aepp.13254

S1: High demand for high-value ag carbon credits “The next cash crop”

- ❑ Valuable and stable source of revenue for participating farmers
- ❑ Needs a credible measuring, reporting, and verification (MRV) system
- ❑ Limited competition from industrial carbon sinks, forestry, and other sources
- ❑ Large-scale adoption of practice changes that generate high-quality credits
- ❑ Liquid markets for agricultural carbon credits, with moderate price volatility
- ❑ Robust financing and adequate risk-management services for farmers and buyers of credits
- ❑ Reinforced by: value chains for low-carbon commodities, articulated protocols (migration across carbon programs).

Wongpiyabovorn, Plastina, & Crespi. 2022.
https://doi.org/10.1002/aepp.13254

S.2: High demand for low-value ag carbon credits "Low-hanging fruits only"

- ❑ Weak credibility of the measuring, reporting, and verification (MRV) system
- ❑ Perceived quality of ag carbon credits is low
- ❑ Needs limited competition from industrial carbon sinks, forestry, and other sources
- ❑ Agricultural carbon markets small and underdeveloped
- ❑ Farmers implement only the least-cost practices to generate carbon credits or changes in practices that would be implemented even in the absence of carbon payments

Wongpiyabovorn, Plastina, & Crespi. 2022.
https://doi.org/10.1002/aepp.13254

How to move from S2 to S1?

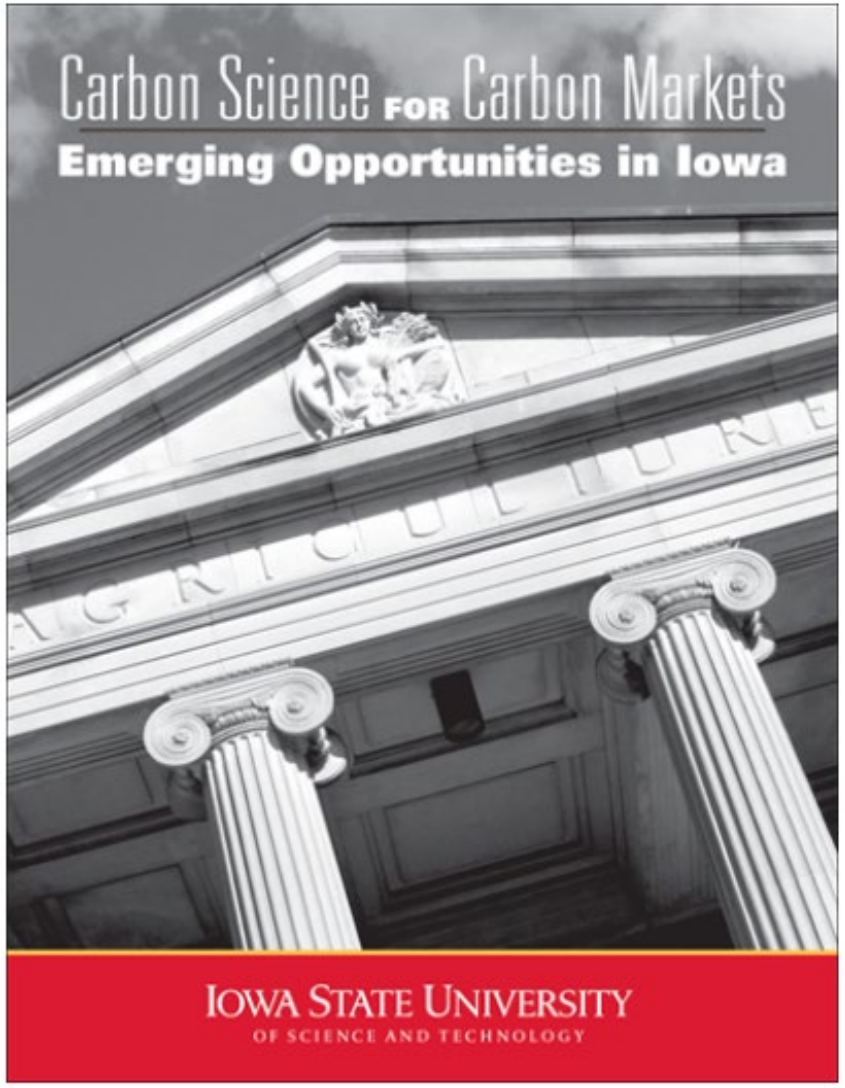
- Address science gaps 1-3 to reduce the uncertainty in the production of ag carbon credits, increase the transparency of the system, and improve the credibility of agricultural carbon credits against other carbon credits

- Develop and enforce minimum standards for carbon credits, and let the market define premiums and discounts with respect to the standard (example: organic markets before/after certification)

How to move from S2 to S1?

- Develop tools to manage production, price, and legal risks for participating farmers:
  - Develop suggested language to include in contractual agreements to protect the balance of powers between carbon programs, farmers, and credit buyers
  - Insurance of carbon production? (similar to crop insurance)?
  - Minimum payment for program participation plus performance-based premium?
  - Stacking payments from carbon programs (all private), and USDA/NRCS programs?
  - Subsidized soil tests through EQIP?
  - Future role of non-additional practices?

Alejandro Plastina
plastina@iastate.edu
(515) 294-6160



Carbon Science for Carbon Markets: Emerging Opportunities in Iowa

Lisa Schulte Moore, Jim Jordahl

https://store.extension.iastate.edu/product/16214


Farm
Foundation®
Accelerating people & ideas

KRISTINE TIDGREN

Director, Center for Agricultural Law and Taxation

Iowa State University

Farm Foundation
Accelerating people & ideas

Legal Considerations for Carbon Contracts

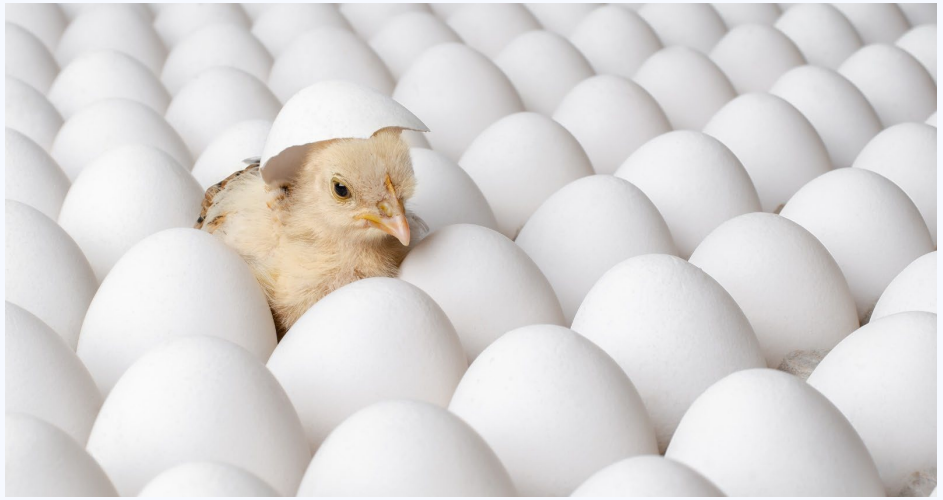
Farm Foundation Forum: *Solving the Barriers to Agricultural Carbon Markets*

APRIL 12, 2022

Kristine Tidgren
Center for Agricultural Law & Taxation
ktidgren@iastate.edu
www.calt.iastate.edu

General Considerations

- The soil carbon sequestration/emission reduction "market" is an uncertain, evolving space, particularly in the agriculture sector.
- New standards will likely emerge and additional opportunities will no doubt open up down the road.
- Early adopters must consider potential missed opportunity costs.



General Agreement Considerations

- These contracts contain many provisions, some which may catch producers by surprise. **No one should sign an agreement** without reading it thoroughly and understanding all terms.
  - These contracts are **written by the attorneys for the aggregators, the brokers, or the sponsoring organizations.** They will be written in the best interest of those parties (that's their job).
    - It is advisable for producers to consult legal counsel to review.
    - There are no standard agreements. Every arrangement is a little different.

Contractual Rights v. Property Rights

Contractual Rights v. Property Rights

- These agreements are generally creating **contractual rights and** sometimes **a new personal property asset (credit)**.
- They do not generally seem to convey **real property rights**.
  - No lease arrangement or easement conveyance more typical of programs that impact land use.
  - No restrictive covenant or deed restriction that would *run with the land*.
  - No "recording" or notice mechanism to ensure land is not "double booked."

Producers Must Understand the Program

- Signing an agreement with a private company is a promise to provide something of value to that company in exchange for something of value.
- Lots of models out there. They are not all the same.

Producers Must Know What They Are "Selling"

- The producer must thoroughly understand the nature of the program.
  - Is the contracting party paying for a **practice** or paying for an **outcome**?
    - Sequestration or Emission Reduction?
  - For how many **years** is the farmer bound?
  - What other **opportunities** is the farmer giving up?
- Is a new carbon offset or credit (**asset**) being created?
  - Who owns this new asset? Who buys and sells it?

Additionality

- Most programs only apply to **NEW** programs the producer implements (otherwise credit is not valid).
  - Penalizes **early adopters** of conservation practices.
  - Means that producers should **select carefully**.
    - Once they've enrolled in one program, they will likely be ineligible for another program, without a "portability" provision.

Stacking

- Contracts generally **prohibit "stacking"** programs or receiving payments from other programs for the same practice or outcome.
- Some programs advertise, however, that implementing certain practices will result in **multiple benefits**: i.e. water quality and carbon sequestration.
- Some contracts

provide additional compensation

for "stacked" practices.

Permanence and Leakage

- High quality carbon credits or offsets require assurance of **permanence** and limited **leakage**.
  - These components will be crucial to full participation within the agricultural sector.
  - Lack of these requirements impacts quality of credits or offsets, but requirements to maintain these standards may be intrusive and burdensome.

- **Permanence** – 100 years or more of storage is standard.
- **Leakage** – Oversight of entire operation may be required.

Requirements and Restrictions

- Producers must understand the **specific practices** required throughout the duration of the contract.
- How will the contractual commitments impact agricultural production?
- The producer must consider whether they will be restricted from also enrolling land in government conservation programs (current and future) or from selling a conservation easement while the contract is in force.
    - What **future opportunities** might be foreclosed?
        - 2023 Farm Bill Programs?

Length of the Contract

- Lengths of contracts vary: **1-, 5-, 10-, 15-year** provisions.
  - Some commitments **may run beyond the stated term** (to ensure permanence).
  - Short contracts may still foreclose future options because of **additionality** requirement.
  - Long contracts may cause producers to forfeit more lucrative options arising down the road because of **stacking** prohibition.

Payments under the Contract

- Payment provisions vary significantly (stated $ does not equal actual value).
- Producers must understand **what** they are being paid for and **when** the payment(s) will be made.
  - Paid for implementing a practice, sequestering carbon in soil, or for value of credit or offset?
- What **costs** must be incurred to receive payment (i.e. verifier or broker fee)?
- **How** is payment made? Tokens? Currency? Cryptocurrency?

Verification

- Parties to a carbon contract must pay careful attention to the verification provisions. In particular, it is important to understand who is responsible to engage and pay the verifier and who that verifier must be.
- Of equal importance is understanding clearly what must be measured and verified:
  - Practice implemented
  - Amount of carbon sequestered
  - Overall carbon footprint of operation
- How is measurement taken?

Data Ownership and Disclosure

- Data is the lifeblood of the carbon contract.
- Producers should review the contract provisions regarding **data creation**, **storage**, **and ownership** carefully to ensure that their interests (including **privacy**) are protected.
- How much effort must be devoted to data creation and submission?

Contractual Penalties

- Careful attention should be paid to the penalty provisions of the contract:
  - What are the **penalties for failing to implement required practices** (what about impossibility)? [liquidated damages, termination, repayment with interest?]
  - What are the **penalties if carbon sequestration does not meet required standards**? [again, consider maximums and factors beyond control]
  - What are **penalties if it is determined that additionality requirement or stacking prohibitions** are violated?

Contractual Remedies

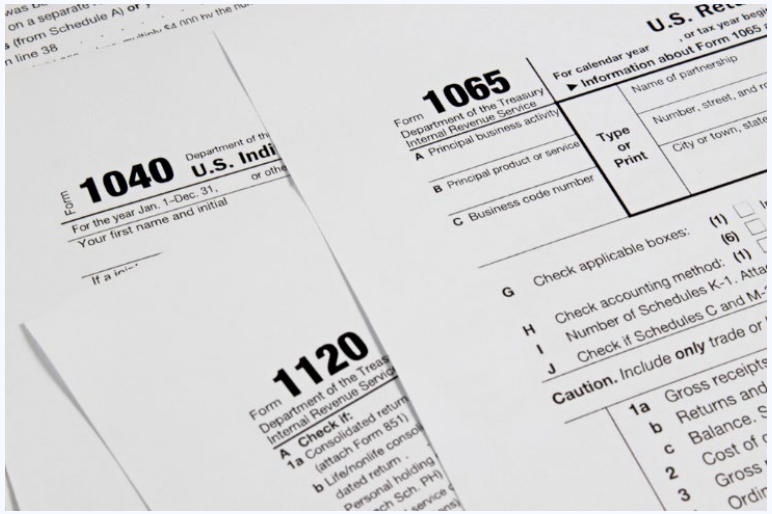
- What is the producer's remedy if the payment is not made on time?
- What happens if 2022 contracted practices are not the best practices in 2026?
- Does the producer have any right to **terminate** or **modify** the contract?
- Does the contract require **arbitration or mediation** to settle disputes?
- Are there **choice of law / venue requirements** built into the contract?
- Are there **attorney fee shifting provisions** in the contract?

Consider Impacts to Third Parties

- Generally, contracts bind **parties only** to the contract.
  - But, consider how contracts may impact:
    - Landlords-Tenants
    - Future purchasers
    - Those who inherit property (personal service obligation?)
    - Mortgagees and lenders

What are the Tax Consequences?

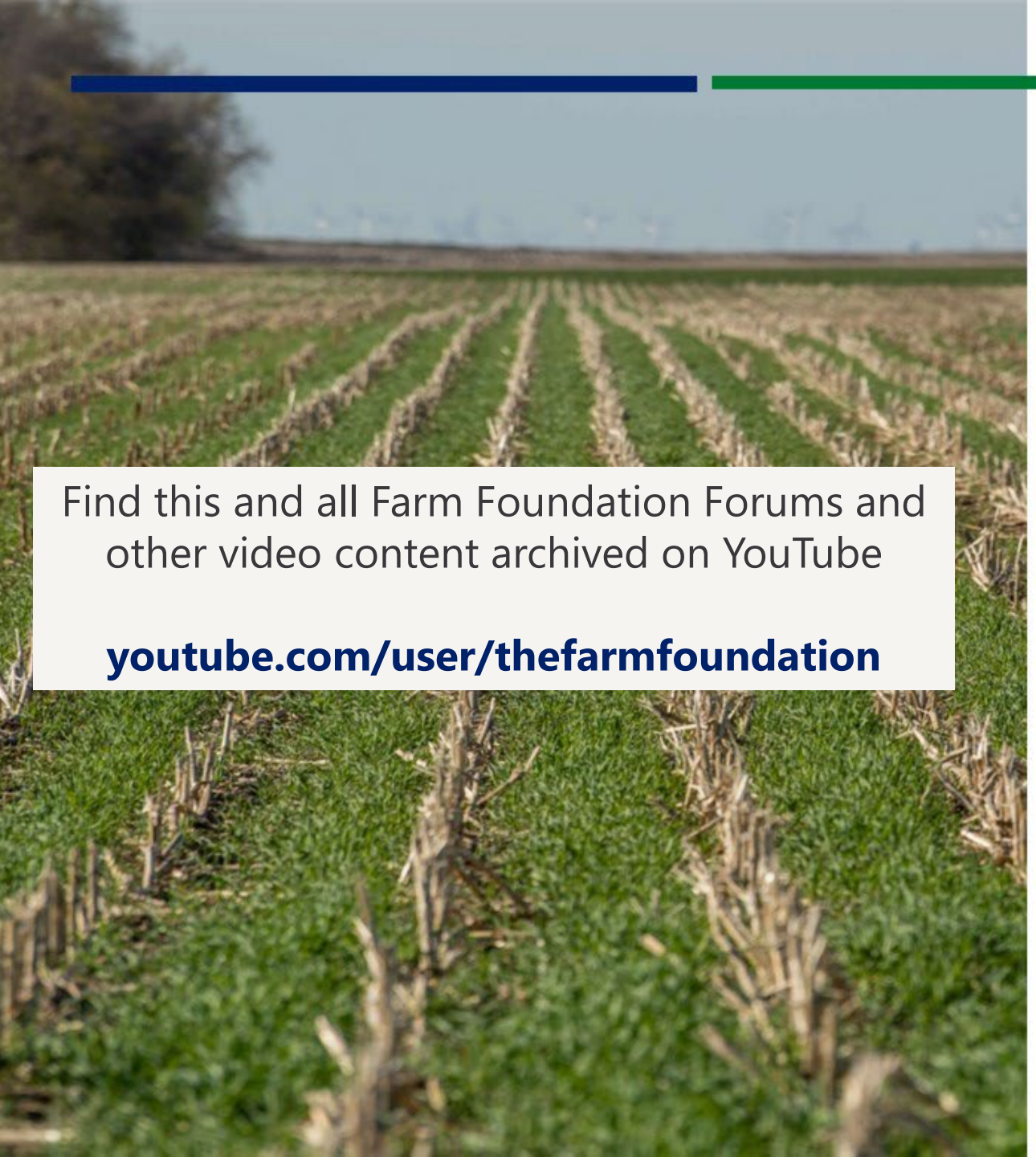
- This will depend upon the interests and obligations that are created and sold.
- In most cases, payments under these agreement will be ordinary income, taxed in the year of receipt, subject to SE tax, as part of the farmer's trade or business.



Final Thoughts

- Producers should seek trusted technical advisors and legal counsel before signing any carbon contract.
- Consider the risks and any lost opportunity costs.


Farm
Foundation®
Accelerating people & ideas



Find this and all Farm Foundation Forums and other video content archived on YouTube

youtube.com/user/thefarmfoundation

FARM FOUNDATION® FORUM

EMERGING CARBON MARKETS: ISSUES AND OPPORTUNITIES

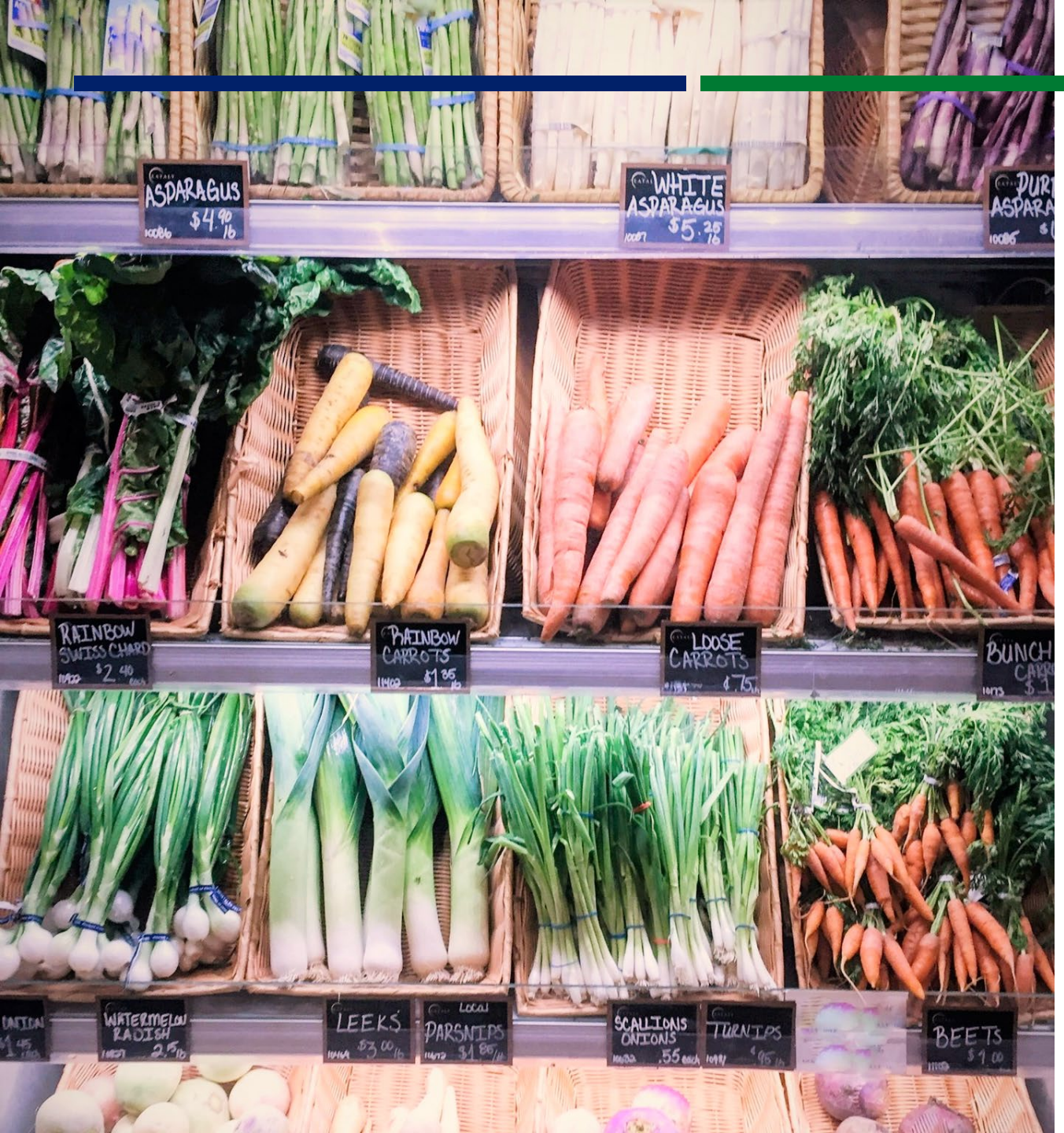
MARCH 16, 2021

FARM CREDIT

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

#FarmFoundationForum

Farm Foundation



SAVE THE DATE FOR THE UPCOMING FARM FOUNDATION FORUM

May 11, 2022: Farm, Food, and the Policies and Practices Behind America's Dietary Health

Get all the details at
www.farmfoundation.org/forums/

Farm Foundation®
Accelerating people & ideas

THANK YOU

Support our Mission

Become a Friend of Farm Foundation today!

farmfoundation.org/friends

We hope to see you at a future event!

#FarmFoundationForum

Farm Foundation®
Accelerating people & ideas