

# Evaluating Agricultural Carbon Markets



**Sarah Sellars, Gary Schnitkey, Krista Swanson, and Jim Baltz**

AAEA Extension Graduate Student Competition

August 1, 2021

**farmdocDAILY**

# Our Team



**Sarah Sellars**

Graduate Research  
Assistant and  
Team Leader

**Gary Schnitkey**

Soybean Industry Chair  
in Agricultural Strategy

**Krista Swanson**

Visiting  
Research Specialist

**Jim Baltz**

*Farmdoc*  
Webinar Manager

# What is farmdoc?

Primary outreach method of

**I ILLINOIS**

Agricultural & Consumer Economics

COLLEGE OF AGRICULTURAL, CONSUMER  
& ENVIRONMENTAL SCIENCES

**Mission:** To provide U.S. Corn Belt crop and livestock producers with constant access to integrated information and expertise to better manage their farm businesses

The screenshot shows the farmdocDAILY website interface. At the top, there is a navigation bar with the University of Illinois logo and the text "ILLINOIS". To the right of the logo, it says "Our Sites:" followed by links for "farmdoc", "farmdocDAILY", and "Farm Policy News". A search icon is also present. Below the navigation bar, the "farmdocDAILY" logo is prominently displayed. Underneath the logo, there is a horizontal menu with links for "Market Prices", "Authors", "By Month", "Categories", "Series", "Tools", "Webinars/IFES", "Sponsors/Donate", and "About Us". Below this menu, there is a "Share This" section with social media icons for Twitter, Facebook, and LinkedIn, and a "download PDF" button. The main content area features the title "Weekly Farm Economics" and the article title "What Questions Should Farmers Ask about Selling Carbon Credits?". The authors listed are Sarah Sellars, Gary Schnitkey, Krista Swanson, and Nick Paulson, all from the Department of Agricultural and Consumer Economics at the University of Illinois. Carl Zulauf is also mentioned, from the Department of Agricultural, Environmental and Development Economics at Ohio State University. The article is dated April 13, 2021, and is identified as "farmdoc daily (11):59". A recommended citation format is provided in a grey box, along with a "Permalink" link. The beginning of the article text is visible, discussing agricultural carbon markets and the opportunity for farmers to receive financial benefits from changing practices.

# Problem

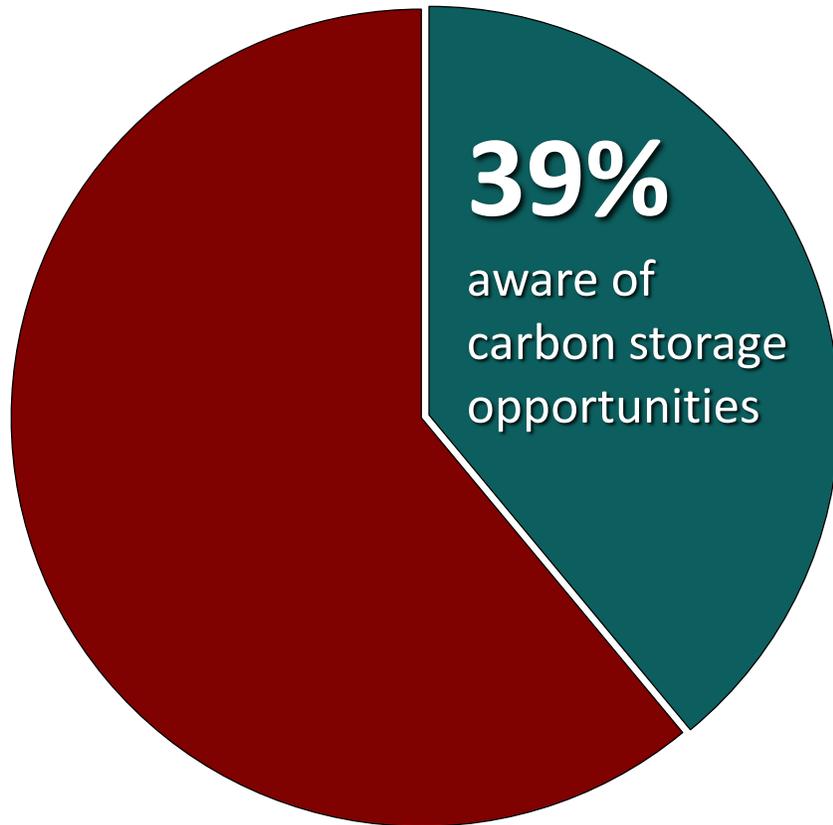
- Lack of **clear, unbiased, and reliable information** about carbon markets for farmers
- Newness of carbon markets

# Why Does this Problem Matter?



Center for Commercial Agriculture

## Purdue Ag Economy Barometer



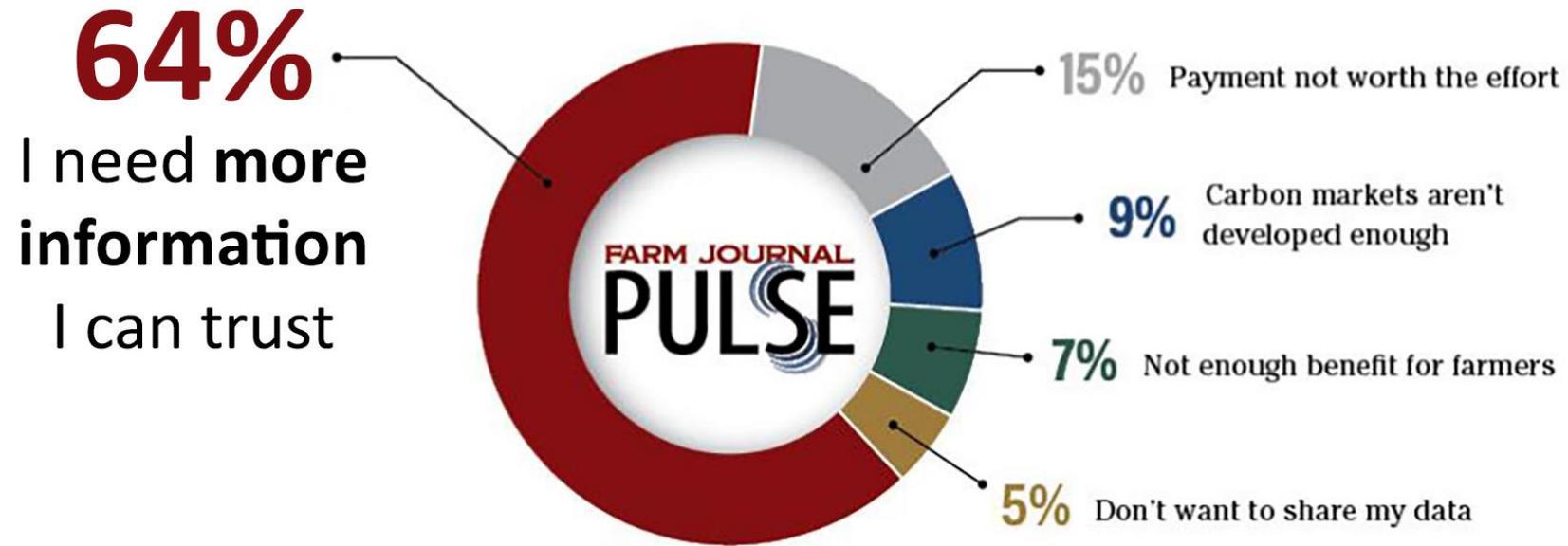
Only

**1%**

have entered  
a contract

Source: <https://ag.purdue.edu/commercialag/home/resource/2021/06/opportunities-and-challenges-associated-with-carbon-farming-for-u-s-row-crop-producers/>

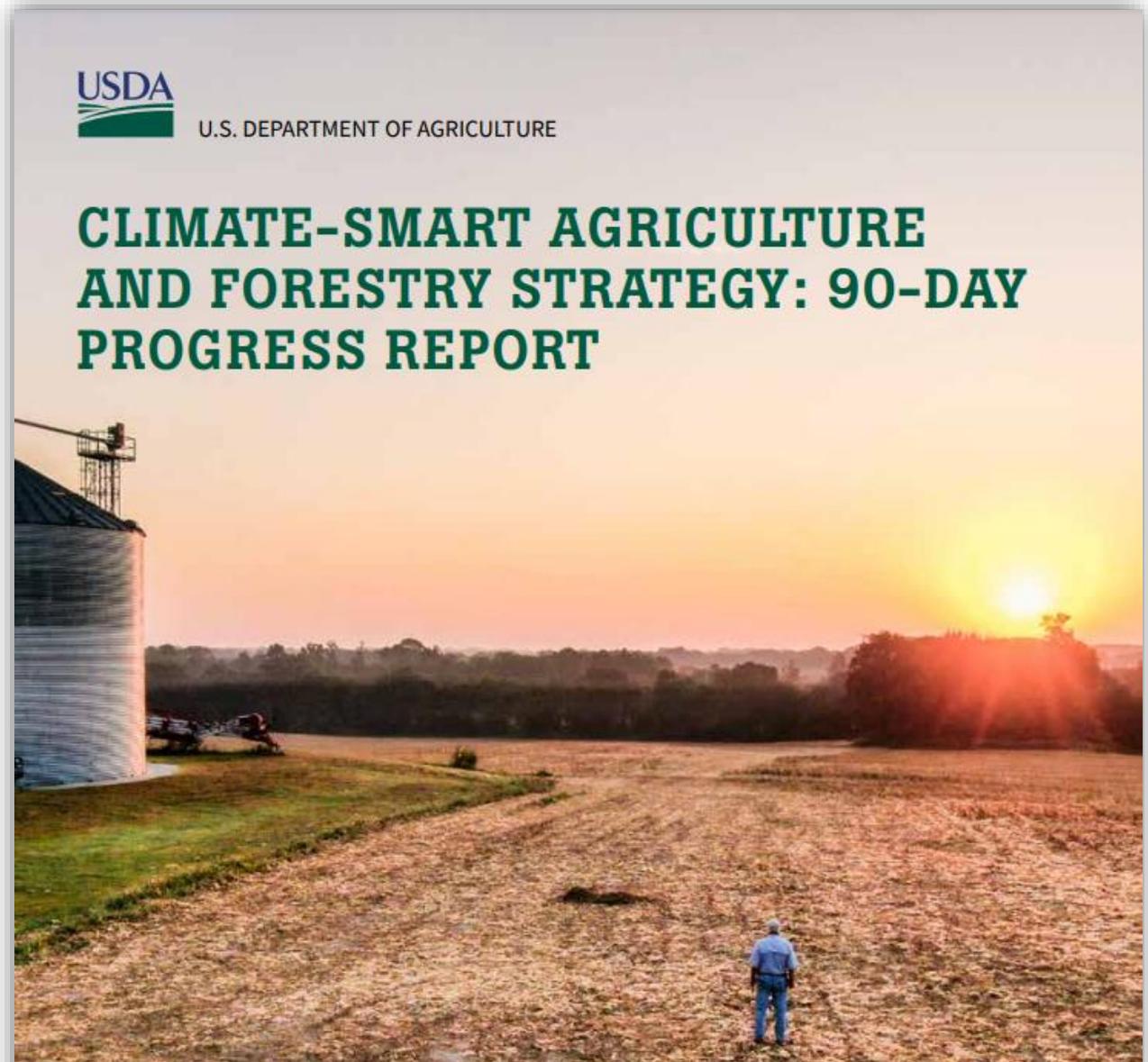
# Why Does this Problem Matter?



RESPONSES: 736

# Why Does this Problem Matter?

**USDA plans to support producer participation in voluntary carbon markets**



# Target Audience



**Farmers**



**Commodity Groups**



**Policy Makers**

# Extension Program Goals

**Communicate** what carbon markets and carbon credits are

**Explain** why carbon markets matter to farmers and policies related to carbon markets

**Address** the questions a farmer should answer before entering a carbon contract

**Explore** how carbon price affects farmers

# Expected Behavioral Changes

- Farmers make an **informed decision** on whether to enter a carbon market
- A shift away from needing more information as a reason for not entering
- Commodity groups adopt policy stances on carbon markets

# Learning Outcomes

What, why, and how of carbon markets

Breakeven prices for carbon credits

How carbon credits fit into climate change policy

How to evaluate carbon contracts



# Expected Use for Information Farmers

- Making **informed decision** about entry in carbon markets
- **Evaluate** carbon market opportunities



# Expected Use for Information

## Commodity Groups

**Make policy  
recommendations**



NATIONAL  
CORNGROWERS  
ASSOCIATION



Minnesota**Corn**  
GROWERS ASSOCIATION



FARM CREDIT  
ILLINOIS

Helping Farm Families Succeed



**GEORGIA**  
Crop Production Alliance

# Expected Use for Information Policy Makers

**Inform policy  
discussion**



# Analytical Research Methods

- Literature Review
- Use of breakeven price and cost data from IFC International Report
- Analysis using Precision Conservation Management (PCM) data



Precision Conservation Management



# What is



Precision Conservation Management



- Field-level data to understand how conservation practices impact farmer net returns
- 6 years of data
- 16 Illinois counties
- 10 Kentucky counties



# Soil Carbon: PCM Data

- **Field to Market** metric for soil carbon using USDA simulation modeling
- Unitless, relative, and crop-specific measure of probable directional change in soil carbon
- Output range of +1 to -1
- Use to explore carbon scenarios

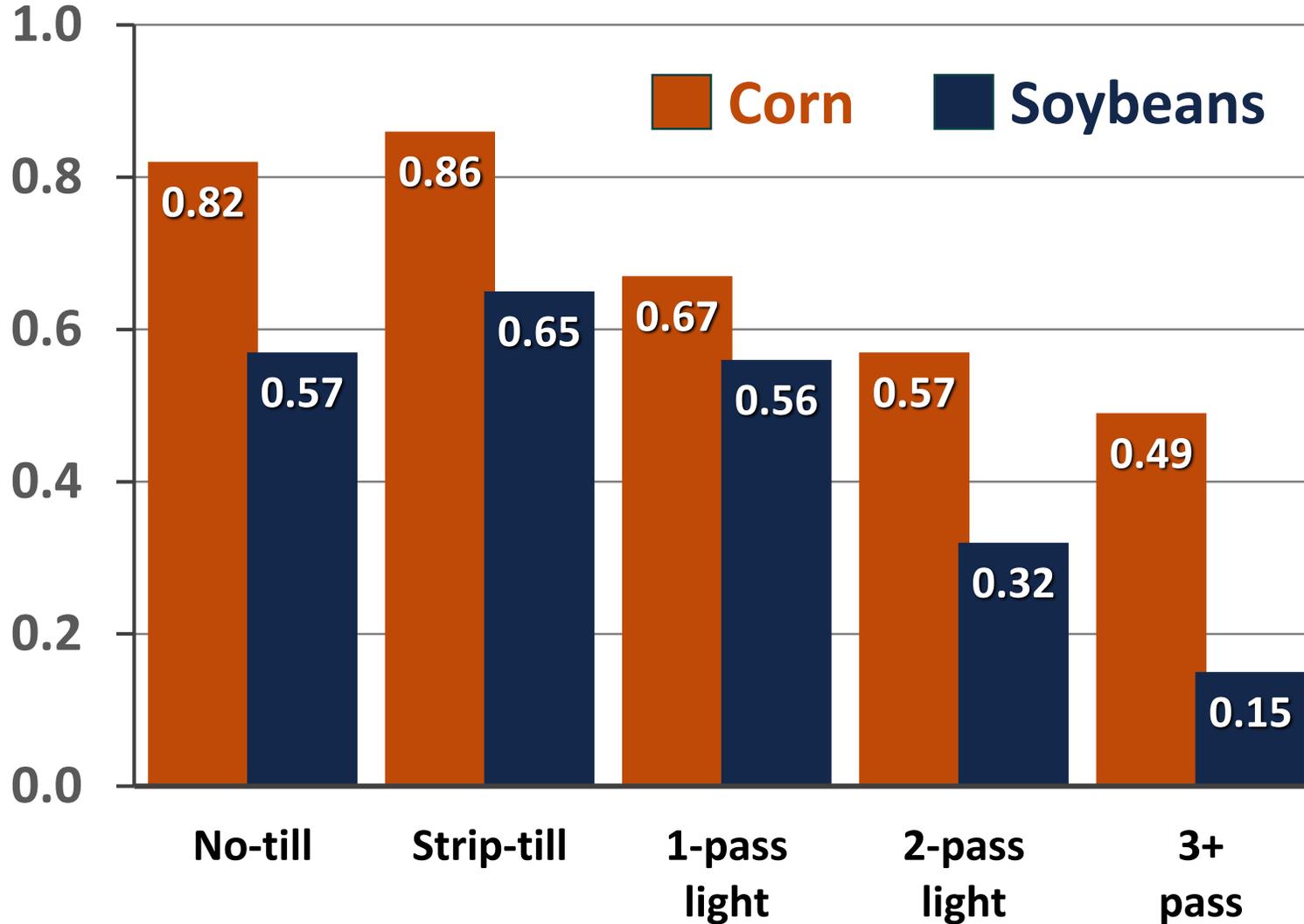


**Field to Market**<sup>®</sup>

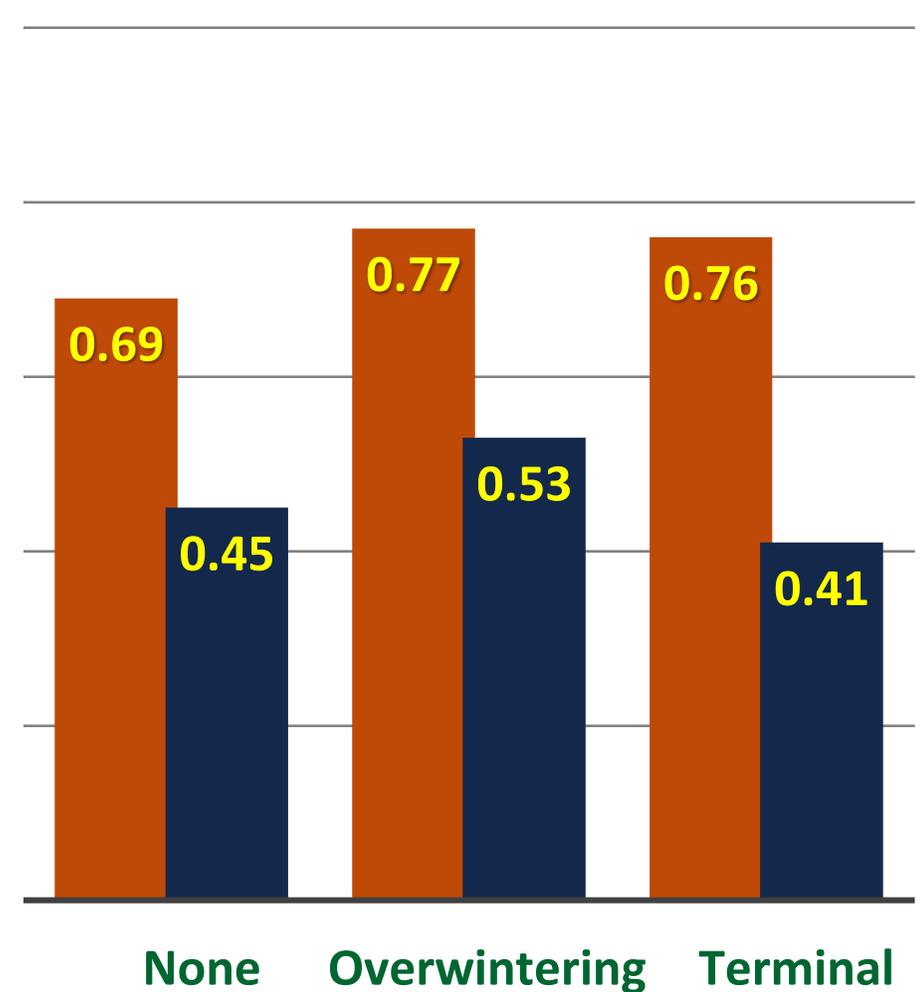
The Alliance for Sustainable Agriculture

# Results

## Tillage Benchmark



## Cover Crop Benchmark

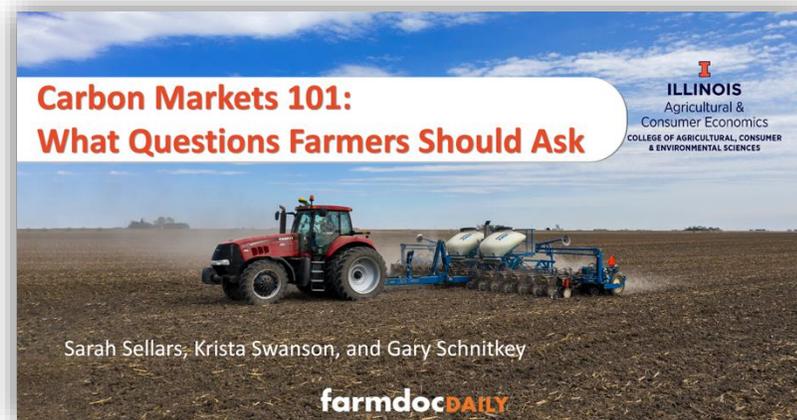


# Delivery Methods

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### Weekly Farm Economics

#### What Questions Should Farmers Ask about Selling Carbon Credits?

Sarah Sellars, Gary Schnitkey, Krista Swanson, and Nick Paulson

Department of Agricultural and Consumer Economics

University of Illinois

Carl Zulauf

Department of Agricultural, Environmental and Development Economics

Ohio State University

April 13, 2021

farmdoc daily (11):59

Recommended citation format: Sellars, S., G. Schnitkey, C. Zulauf, K. Swanson and N. Paulson. "What Questions Should Farmers Ask about Selling Carbon Credits?." *farmdoc daily* (11):59, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, April 13, 2021.  
[Permalink](#)

Agricultural carbon markets exist through privately and publicly owned companies with aim to reduce carbon emissions through trade of carbon units sequestered at the farm level. The sale of carbon credits presents an opportunity for farmers to receive financial benefits from changing to more environmentally beneficial agricultural practices, although carbon prices may not currently be high enough to cover the cost of switching practices. Information about carbon markets can be challenging to navigate because each company typically has a different structure for payments, verification, and data ownership. This article provides a brief background about carbon markets, information about the breakeven price for carbon sequestration practices, and some questions for farmers to consider about selling carbon credits.

#### Background

Greenhouse gases (GHG) change the natural balance between energy received from the sun and emitted from the earth by trapping energy from the Earth in the atmosphere, altering the climate and weather. Greenhouse gases emissions are either anthropogenic or natural. Anthropogenic emissions are caused by human activities such as burning fossil fuels, and natural emissions are caused by such occurrences as volcanic eruptions, the Earth's orbit, the carbon cycle, and the sun's output. The effect of anthropogenic emissions is greater than the effect of natural emissions, with human activities suggested to be the main cause of global warming over the last 50 years. The major greenhouse gases are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>),

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**What is a Carbon Credit?**  
Carbon Markets 101

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PLAY ALL

**Carbon Markets 101**  
8 videos • 59 views • Last updated on Jul 13, 2021

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3 **Carbon Markets 101: What is the Paris Agreement?**  
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4 **Carbon Markets 101: Price & Cost Questions**  
farmdoc University of Illinois 5:15

**Carbon Markets 101: Agricultural Carbon**

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July 29, 2021  
Maggie Cornelius and Husain Kurawadwala

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# Delivery Methods



The screenshot shows a YouTube playlist interface. At the top, the YouTube logo and search bar are visible. The left sidebar contains navigation icons for Home, Explore, Subscriptions, Library, and History. The main content area features a large video thumbnail for 'What is a Carbon Credit?' with a 'PLAY ALL' button. Below this, the playlist title 'Carbon Markets 101' is displayed, along with statistics: '8 videos · 59 views · Last updated on Jul 13, 2021'. The channel name 'farmdoc University of Illinois' and a 'SUBSCRIBE' button are also present. The right side of the screen shows a list of 8 video thumbnails with their titles and durations.

Video Number	Video Title	Duration	Channel
1	What is a Carbon Credit?	2:58	farmdoc University of Illinois
2	Carbon Markets - Why Now?	3:05	farmdoc University of Illinois
3	Carbon Markets 101: What is the Paris Agreement?	6:12	farmdoc University of Illinois
4	Carbon Markets 101: Price & Cost Questions	5:15	farmdoc University of Illinois
5	Carbon Markets 101: Agricultural Carbon Credit Contracts and Data Questions	3:06	farmdoc University of Illinois
6	Carbon Markets 101: Breakeven Prices for Agricultural Practices	4:25	farmdoc University of Illinois
7	Carbon Markets 101: Can carbon credits increase in price?	4:33	farmdoc University of Illinois
8	Challenges of Agricultural Carbon Markets		farmdoc University of Illinois

# Delivery Methods: Webinars and Meetings

## Carbon Markets 101: What Questions Farmers Should Ask

**April 28, 2021**

Staff of National  
and State Corn  
Growers  
Associations  
91 attendees

**June 10, 2021**

National Corn  
Growers  
Association  
Carbon Task  
Force  
6 attendees

**July 13, 2021**

National Corn  
Growers  
Association  
Access Teams  
70 attendees

**July 28, 2021**

Farm Credit  
Illinois Meeting  
50 attendees



# Team Roles



**Sarah Sellars**



**Dr. Gary Schnitkey**



**Krista Swanson**



**Jim Baltz**

Writing farmdoc daily articles

Filming YouTube videos

Managing webinars,  
Producing YouTube  
videos

Presenting the  
breakeven costs  
and questions  
farmers should ask  
at webinars

Covering the  
background and  
economics of  
carbon markets at  
webinars

Covering the advice  
for evaluating  
carbon markets and  
policy at webinars

# Delivery Challenges

**Carbon market information changes frequently**

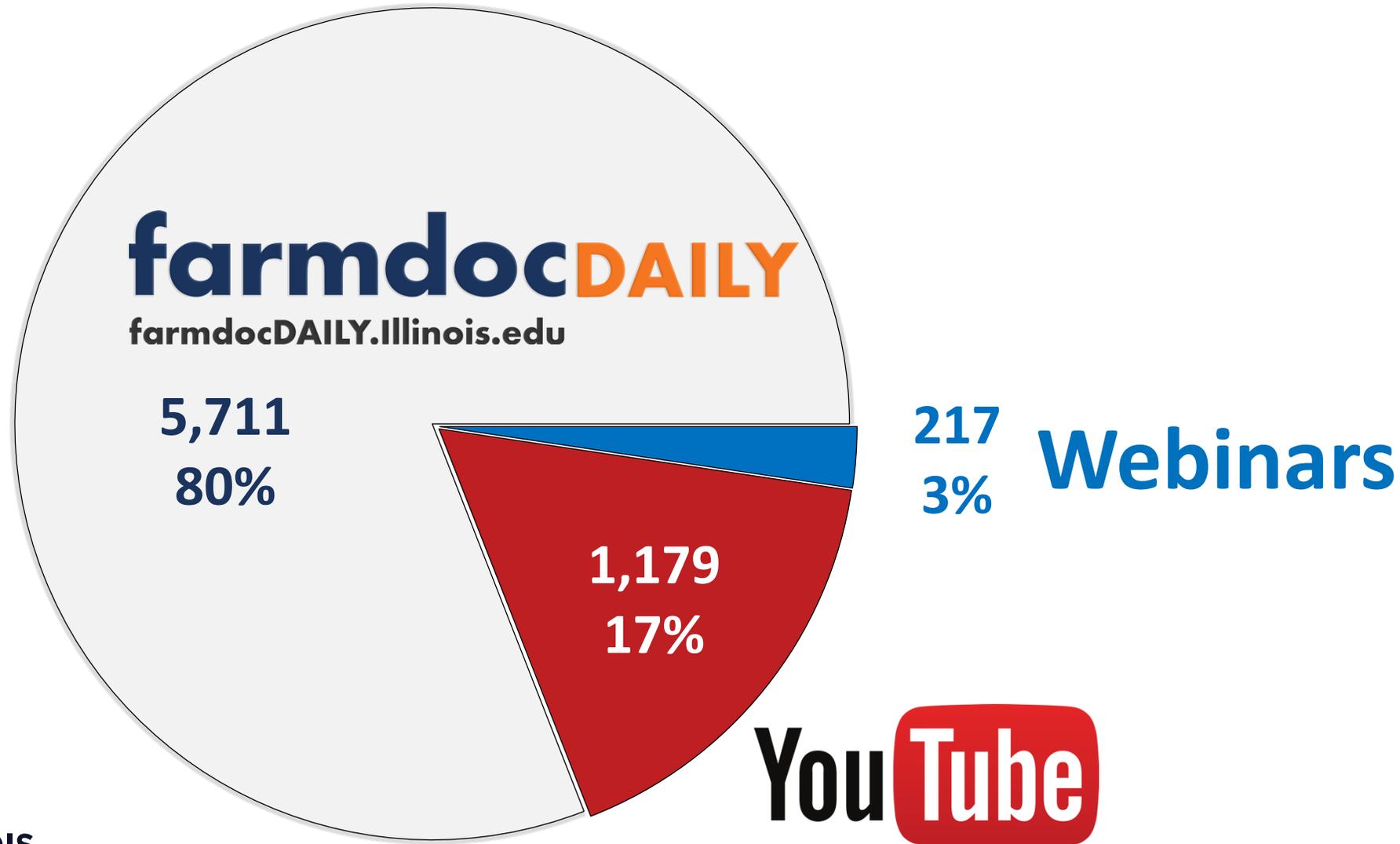
**Solution:** Follow news closely, update slides and videos **frequently**

**Information targeted toward corn and soybean farmers**

Expand information to include livestock farmers and possibly other crops

# Program Reach

Total Outreach: 7,107 people as of 7/21/21



# Evaluating Program Effectiveness

- Extension Program Advisory Committee
- Evaluation based on clarity of materials, effectiveness of the materials related to our goal, and content relevance



**Illinois Extension**  
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

# Evaluation

How relevant is the content in our Evaluating Agricultural Carbon Markets Extension program? \*

1 2 3 4 5

Not Relevant      Very Relevant

Are there other topics you would like to see discussed in our content related to agricultural carbon markets?

Your answer \_\_\_\_\_

Please rate the effectiveness of our Extension program related to our goal of giving farmers clear, direct, and valuable information to help them make decisions about the carbon market. \*

1 2 3 4 5

Not Effective      Very Effective

Do you have any ideas about how we can increase the effectiveness of our Extension program?

Your answer \_\_\_\_\_

Are the materials in our Extension program clear? \*

1 2 3 4 5

Not Clear      Very Clear

Do you have any ideas about how we could improve the clarity of our materials about agricultural carbon markets?

Your answer \_\_\_\_\_

Which outlet is the most effective way of communicating carbon market information to farmers? \*

- Farmdoc Daily Articles
- Webinars
- YouTube Videos
- All of the above
- Other: \_\_\_\_\_

Do you have any other comments you would like to share about our extension program?

Your answer \_\_\_\_\_

# Future Extension Activities



- Agricultural Carbon Markets: A Case Study of Alberta
- Analysis of Carbon Markets Using PCM Data
- Policy Articles



- What practices are companies paying for?
- What is the Growing Climate Solutions Act?
- Advice for farmers evaluating carbon markets
- How do carbon credits impact grain farmers?
- How do carbon credits impact livestock farmers?

## Webinars

- **August 6, 2021:** Minnesota Corn Growers Association
- **October 21, 2021:** Georgia Crop Production Alliance

### Farmdoc Webinars:

- Agricultural Carbon Markets: Information for Evaluating
- Agricultural Carbon Markets and Government Policy

# Thank You!

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**Sarah Sellars**  
ssellar2@illinois.edu

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