

Cover Crops 101

Maximizing Benefits for Midwest Farmer



Laura Gentry



Zach Wells



Gary Schnitkey



Megan Miller

Benefits of Cover Crops

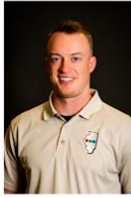
by Laura Gentry





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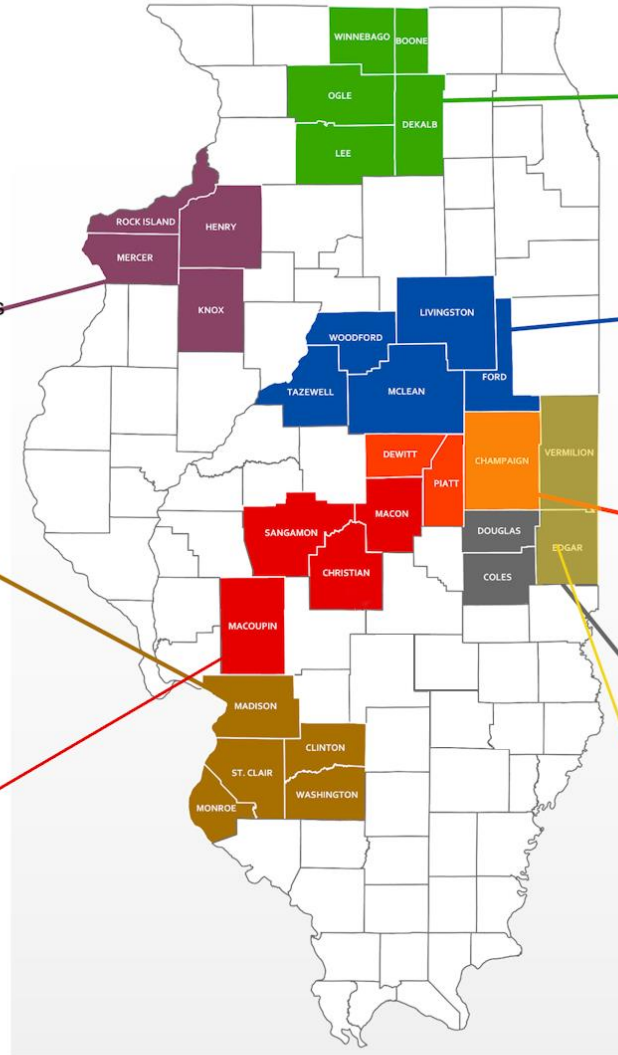
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Kent Bohnhoff

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A program of the *IL Corn Growers Association* and the *Illinois Soybean Association*

2015-2022 DATA SUMMARY

The Business Case for Conservation

Cost-Benefit Analysis of Conservation Practices



Annual Data Booklet in *PRAIRIE FARMER*

Learn more at www.precisionconservation.org

PCM
Precision Conservation Management

ABOUT US ▾ NEWS ▾ PARTNERS ▾ LOG-IN COMING SOON - QUICK STATS EVENTS

Increasing Farm Incomes and Environmental Outcomes

An Innovative Farm Conservation Service Program serving Illinois, Nebraska and Kentucky

[Join Now](#) [Questions? Contact Us](#)

Field Level Farm Data

Farm Data - Farmers collect detailed field data using the *free Farmer Portal* tool

Services - PCM provides analysis & one-on-one consultations with conservation experts

Data Security Guarantee - Individual farm data is protected [not shared] unless the farmer chooses to do so

[Read More...](#)

Data Analysis for Business Decision Support

Projections & Reports - Based on the unbiased, detailed conservation practices of **Real Farmers**

Results - Improved economic performance & measurable improvements in conservation practices

[Read More...](#)

Conservation, Government Program & Supply Chain Support

Data - Supporting improvement in precision farming practices

Farmer Access - To projects & partners that support their conservation efforts

[Read More...](#)

Environmental Impact & Measureable Improvements

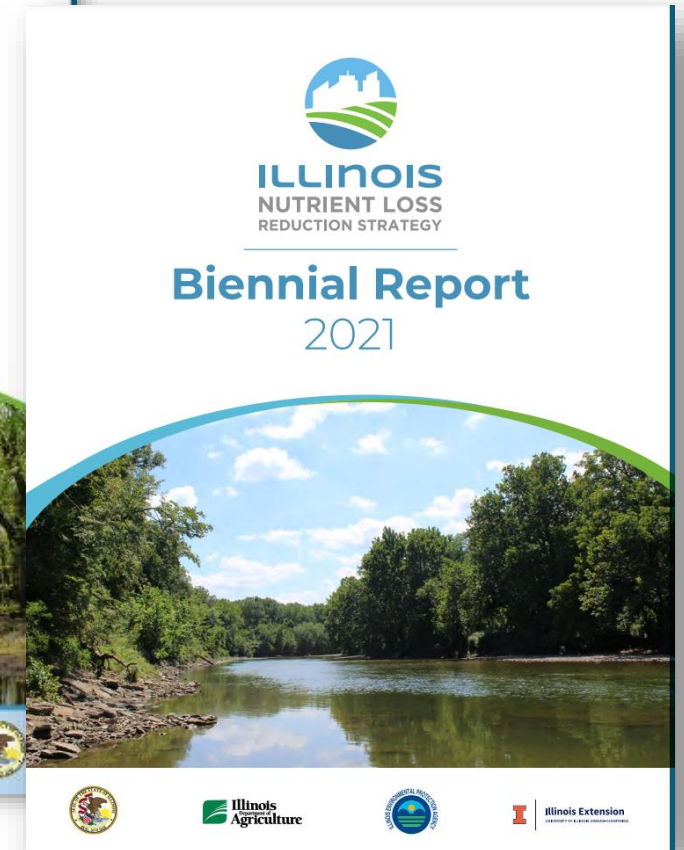
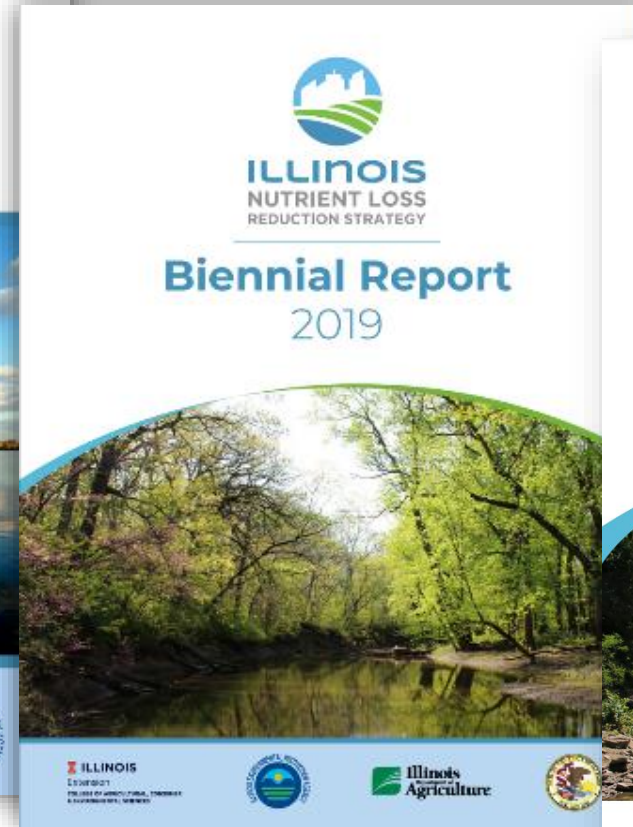
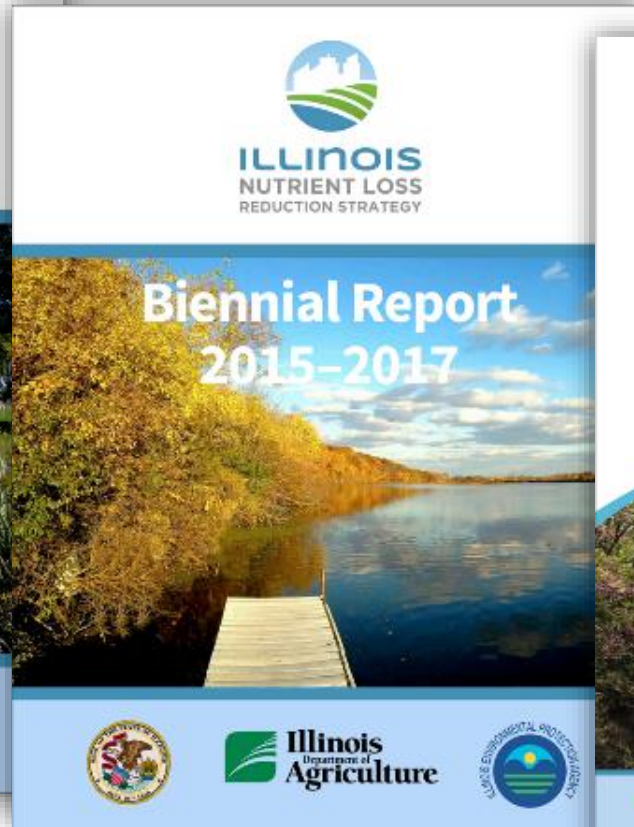
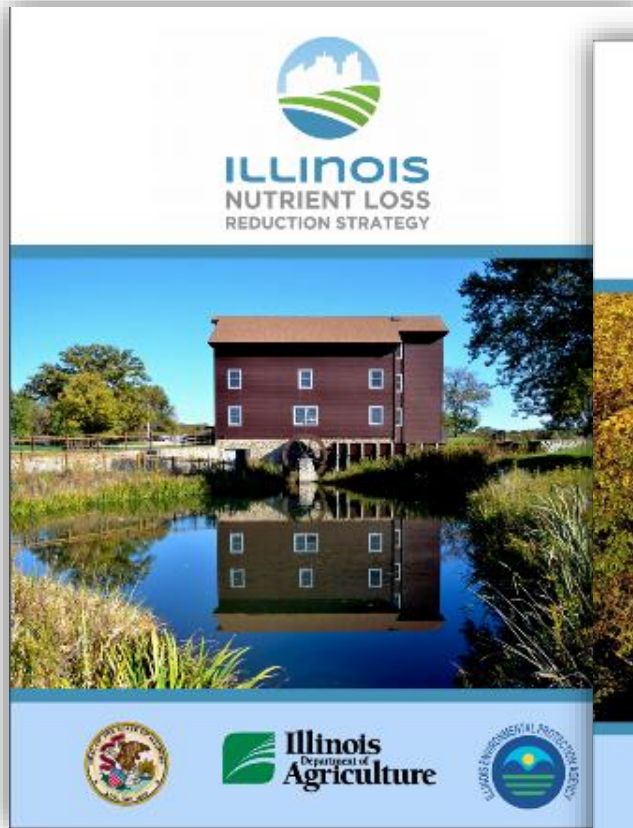
Measurable Improvements - For Farmers, Supply Chain Members, Consumers & Legislators

End Goal - Continue to move the needle to improve water quality & soil health

[Read More...](#)



Illinois Nutrient Loss Reduction Strategy



Goal: 45% Reduction in Total N & Total P Losses by **2035**

Interim: 15% Reduction in NO₃-N & **25% Reduction** in Total P by 2025

<https://epa.illinois.gov/topics/water-quality/watershed-management/excess-nutrients/nutrient-loss-reduction-strategy.html>

SCIENCE ASSESSMENT

Mark B. David, Gregory F. McIsaac, Gary D. Schnitkey, George F. Czapar, and Corey A. Mitchell

Determined

- $\text{NO}_3\text{-N}$ and P losses for the state of IL during the baseline period
- Regional loadings
- Management practice effectiveness & scenarios

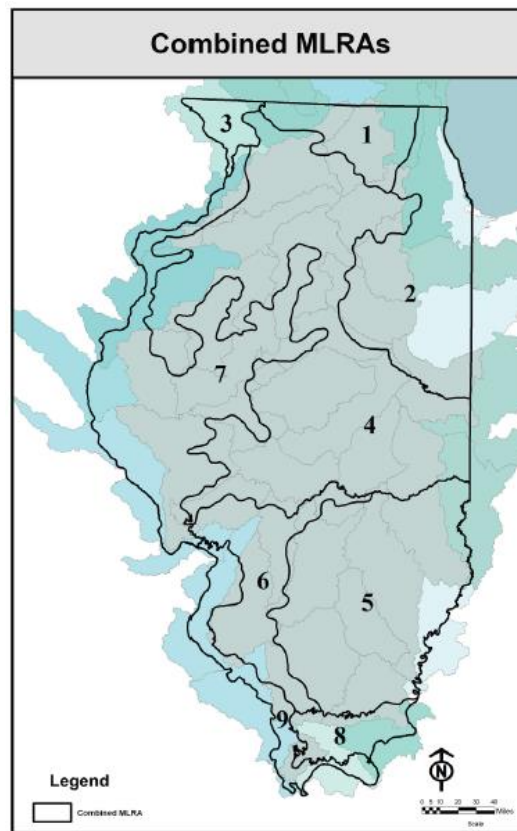


Figure 3.17. Combined MLRAs shown with HUC8s overlaid.

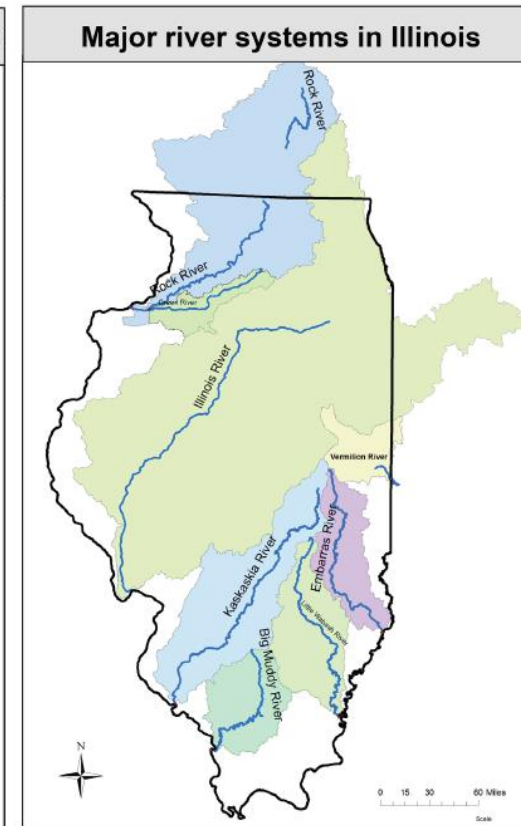
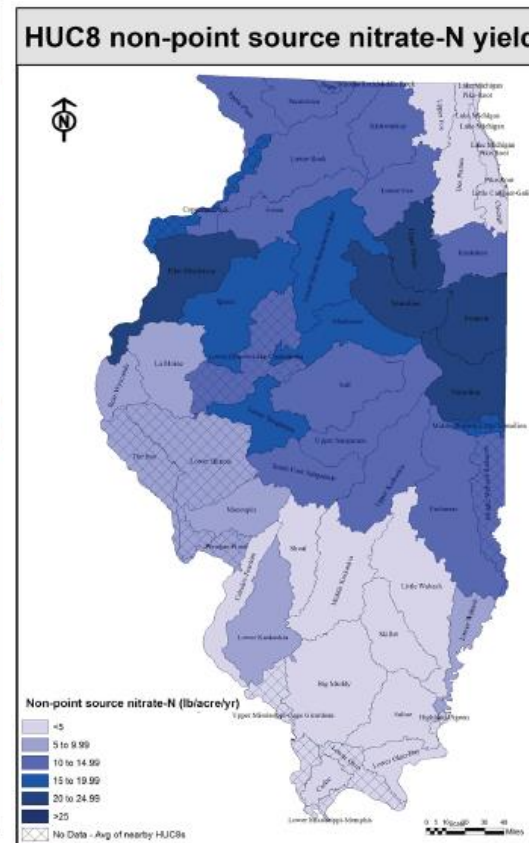


Figure 3.1. The eight major river systems used in estimating state nutrient loads. Note that gaging stations are upriver from the state boundary, so the estimated area is smaller.

1980-1996 BASELINE

- 404M lb $\text{NO}_3\text{-N}$ /year
- 34M lb P/year

1980-1996 Baseline

Science Assessment

Table 3.11. Example statewide results for nitrate-nitrogen reductions, with shading to represent in-field, edge-of-field, land use, and point source practices or scenarios.

Practice/scenario	Nitrate-N reduction per acre (percent)	Nitrate-N reduced (million lb)	Nitrate-N reduction from baseline (percent)	Cost (\$/lb removed)
Reducing N rate from background to MRTN on 10 percent of acres	10	2.3	0.6	-4.25
Nitrification inhibitor with all fall-applied fertilizer on tile-drained corn acres	10	4.3	1	2.33
Split application of 50 percent fall and 50 percent spring on tile-drained corn acres	7.5-10	13	3.1	6.22
Spring-only application on tile-drained corn acres	15-20	26	6.4	3.17
Split application of 40 percent fall, 10 percent pre-plant, and 50 percent side dress	15-20	26	6.4	
Cover crops on all corn/soybean tile-drained acres	30	84	20.5	3.21
Cover crops on all corn/soybean non-tiled acres	30	33	7.9	11.02
Bioreactors on 50 percent of tile-drained land	25	35	8.5	2.21
Wetlands on 35 percent of tile-drained land	50	49	11.9	4.05
Buffers on all applicable crop land (reduction only for water that interacts with active area)	90	36	8.7	1.63
Perennial/energy crops equal to pasture/hay acreage from 1987	90	10	2.6	9.34
Perennial/energy crops on 10 percent of tile-drained land	90	25	6.1	3.18
Point source reduction to 10 mg/L		14	3.4	3.3

In Field

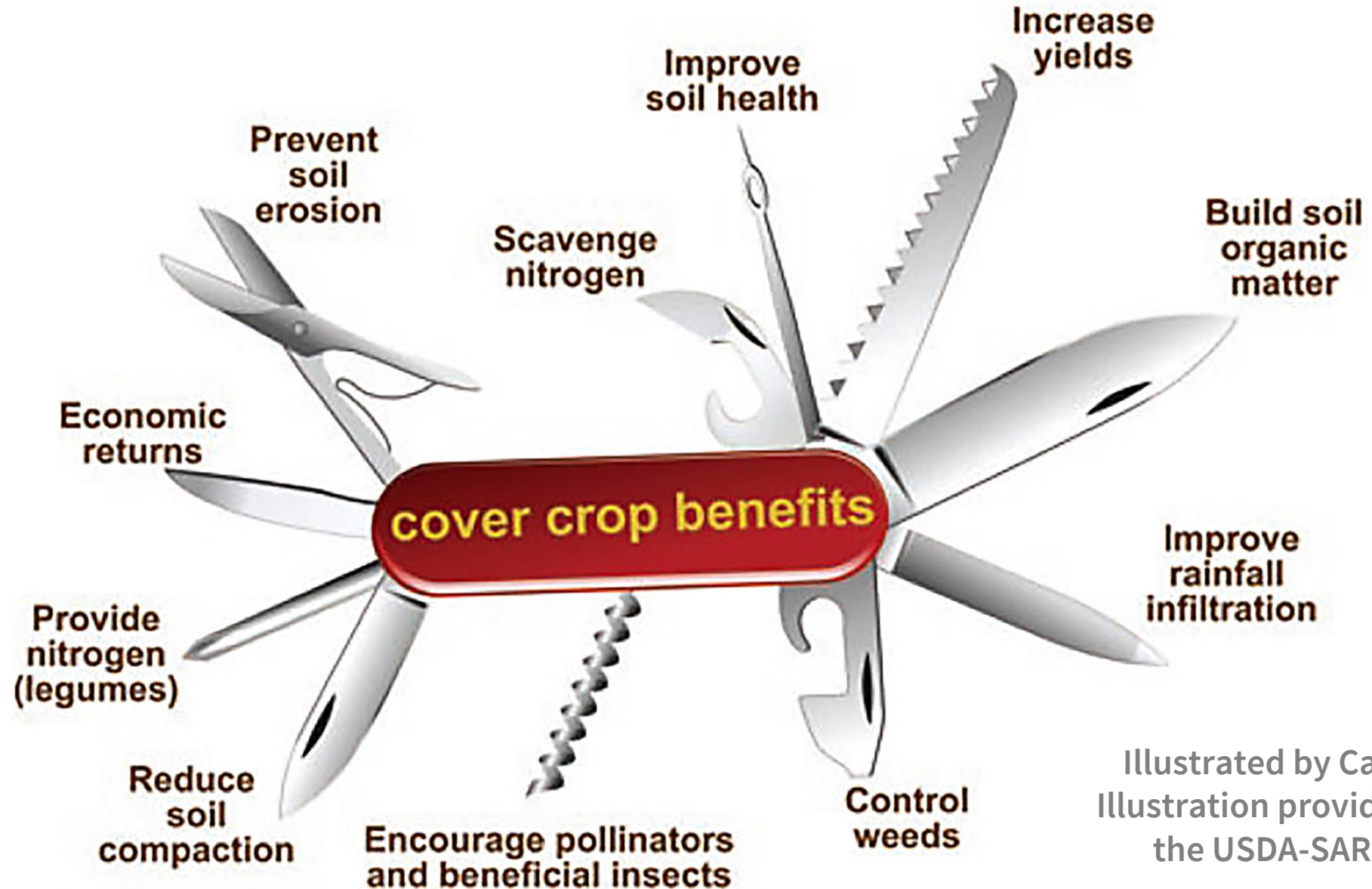
Edge-of Field /End-of-Pipe

Land Use Change

For Each Practice, Load Reductions:

- Per acre
- Statewide
- Percent of Baseline
- Implementation cost (\$/lb removed)

The benefits of cover crops



Illustrated by Carlyn Iverson.
Illustration provided courtesy of
the USDA-SARE program.

COVER CROPS

Improving Life on the Land



For Farmers and Farm Advisors
Seeking to Improve Soil Health

By Robert L. Myers



ESTB



1964

ILLINOIS SOYBEAN

ASSOCIATION

Dr. Robert Myers

Director, MU Center for Regenerative Agriculture



College of Agriculture,
Food & Natural Resources

University of Missouri

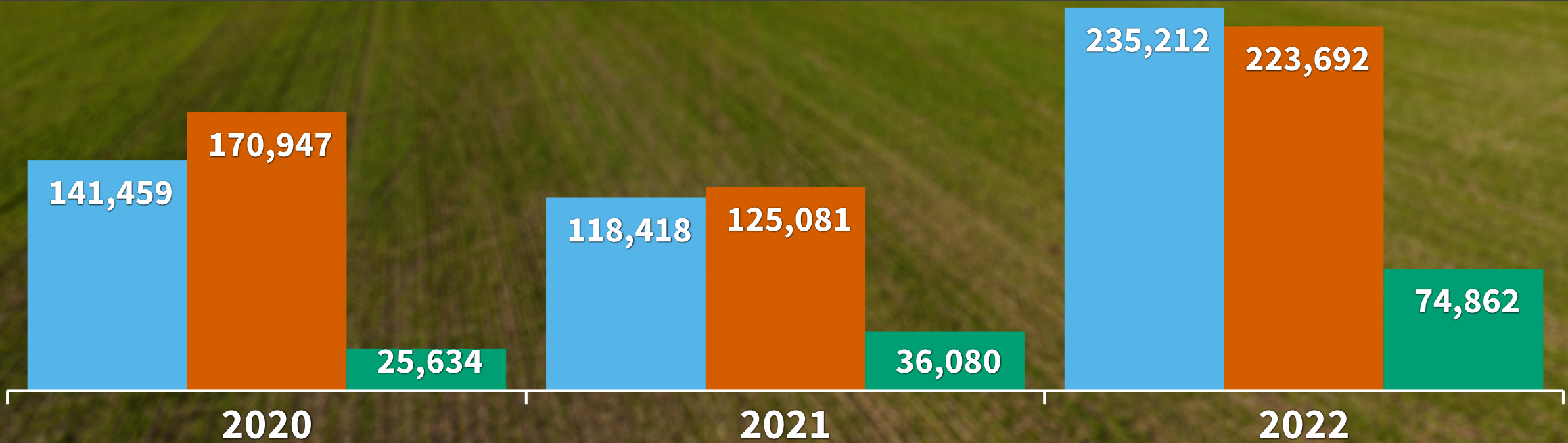


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ILLINOIS

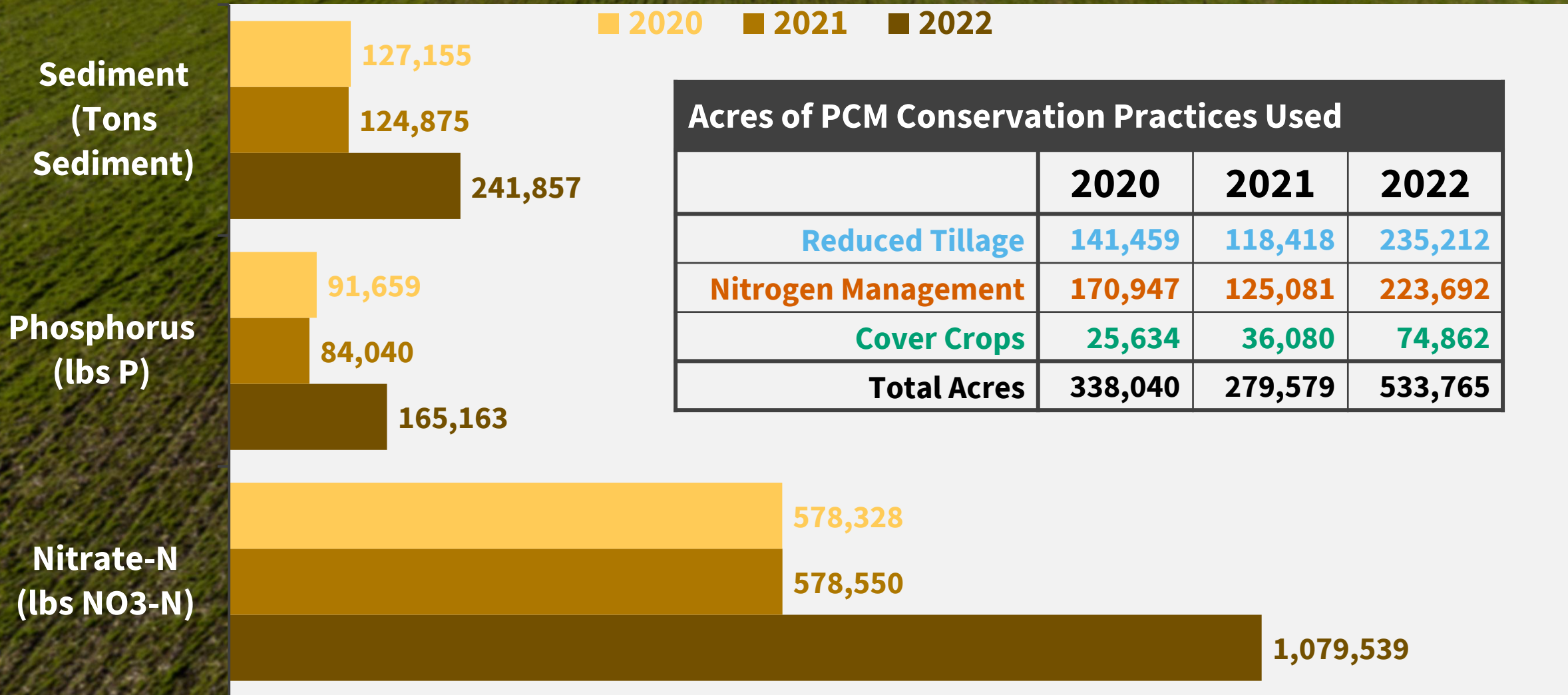
PCM Conservation Practices, Acres

	2020	2021	2022	TOTAL
Reduced Tillage	141,459	118,418	235,212	495,089
Nitrogen Management	170,947	125,081	223,692	519,719
Cover Crops	25,634	36,080	74,862	136,576
Total Acres	338,040	279,579	533,765	1,151,384



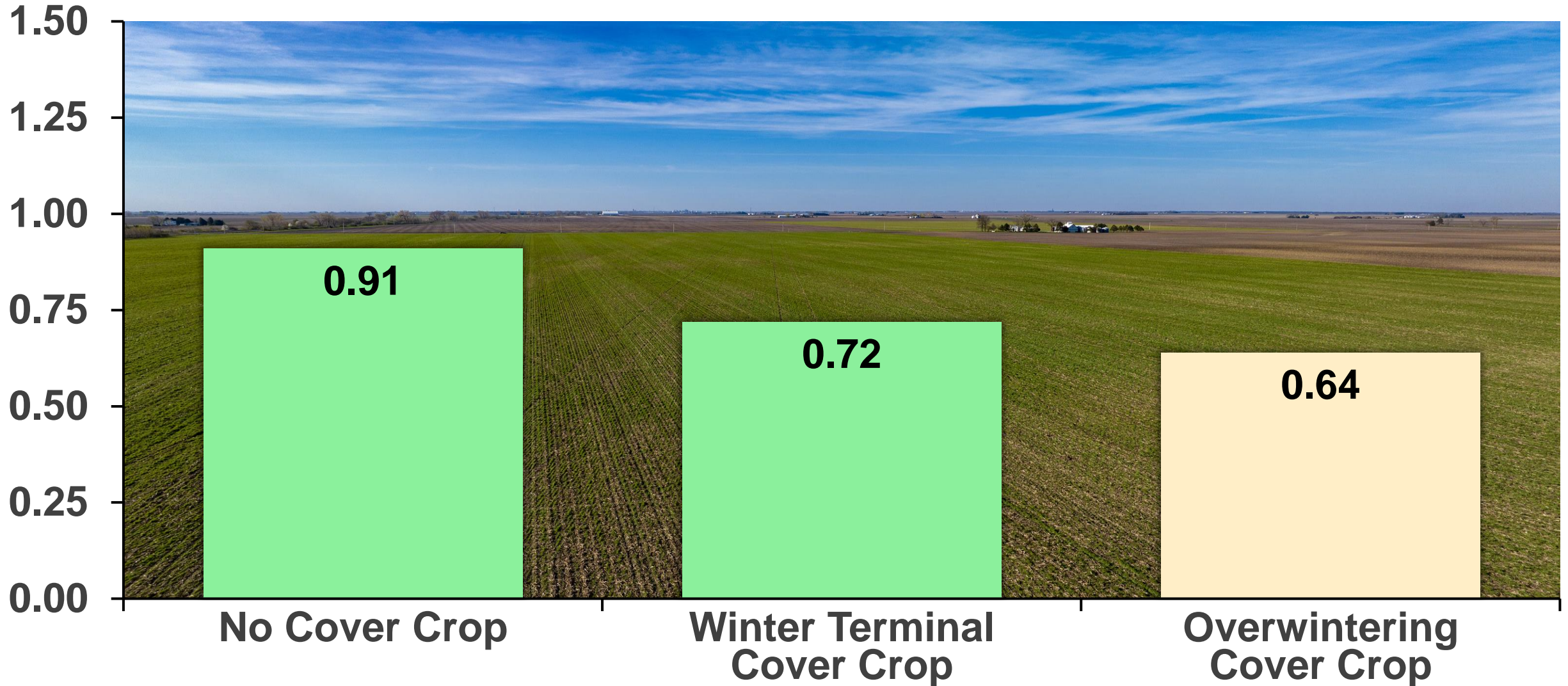
PCM Conservation Practices

Loss Reductions



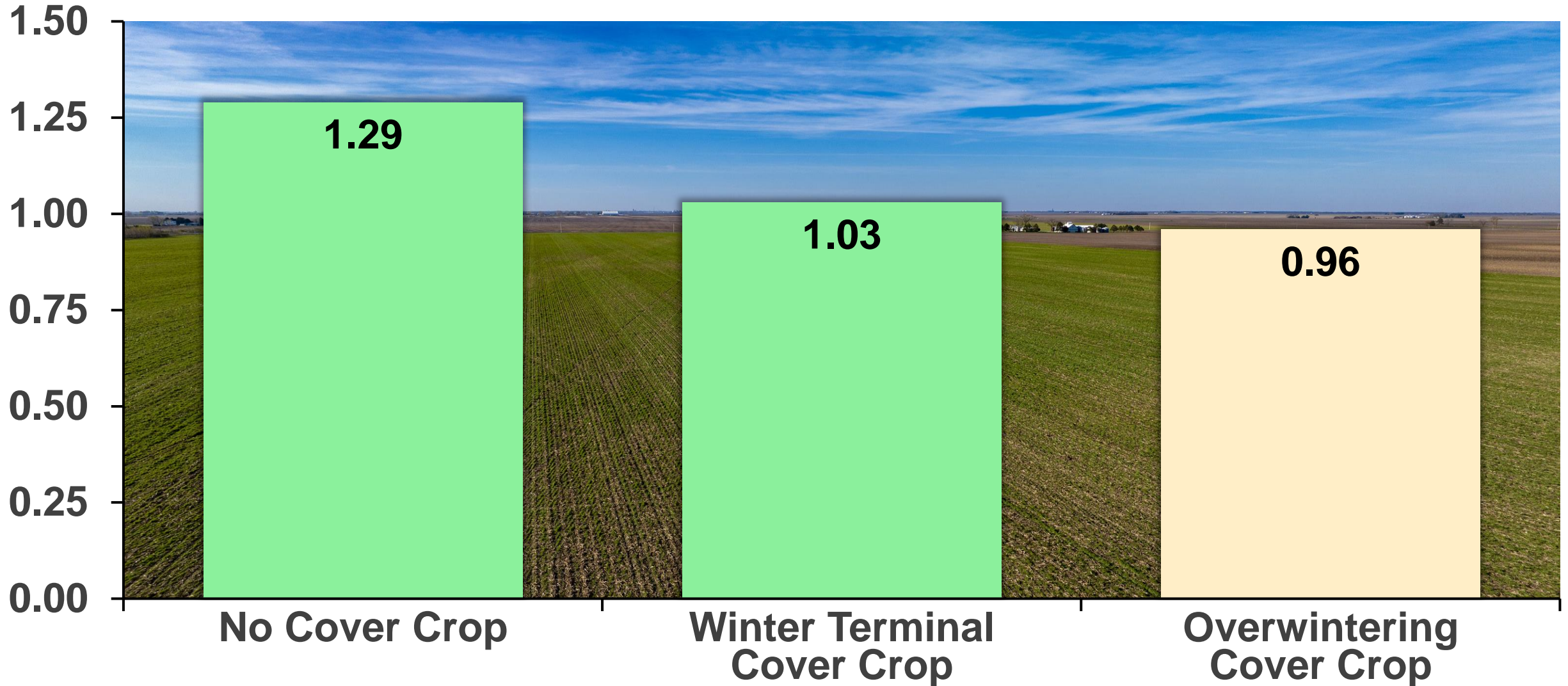
Soil Loss (Tons/acre), by Cover Crop Class

Averages from 2015 to 2022, Corn, High SPR



Soil Loss (Tons/acre), by Cover Crop Class

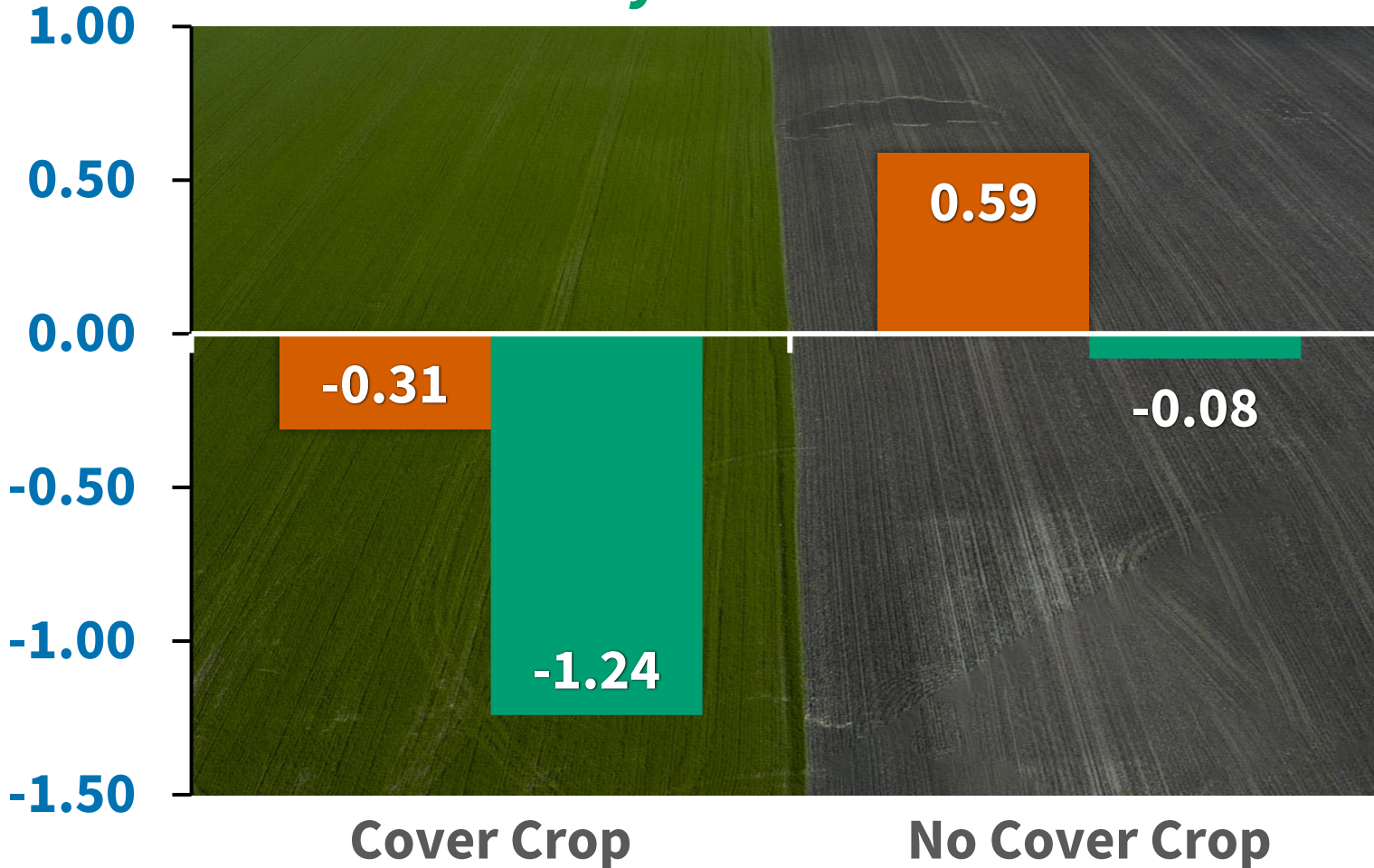
Averages from 2015 to 2022, Soybean, High SPR



GHG emissions in metric tons CO₂e/acre

Averages from 2015 to 2022, High High Soil Productivity Rating (SPR)

■ Corn ■ Soybean





Zach Wells





Economics of cover crops



Gary
Schnitkey

Economics of cover crops

- Cover crops improve “soil health” over time, which should result in **increased yields**. In PCM data, we have not seen increases in yields perhaps because:
 - Cover crops have not been used long enough on PCM farms
 - We have not had years in which cover crops pay
- Cover crops have costs in initial years of use because
 - Learning curve associated with the technology
 - Soil health increases occur slowly over time

Economics of cover crops

Cover crops from corn to soybeans
appears to be the best place to start



Cover Crops

Soybean, High SPR, Average from 2015 to 2022

	No Cover Crop	Overwintering	Winter Terminal
Number of fields	3,750	918	33
Yield per acre	70	68	69
Soil Productivity Rating	140	139	139
Gross Revenue	\$717	\$710	\$688
Total Non-land Costs	\$278	\$311	\$281
Operator & Land Return	\$439	\$399	\$407

Cover Crops

Soybean, High SPR, Average from 2015 to 2022

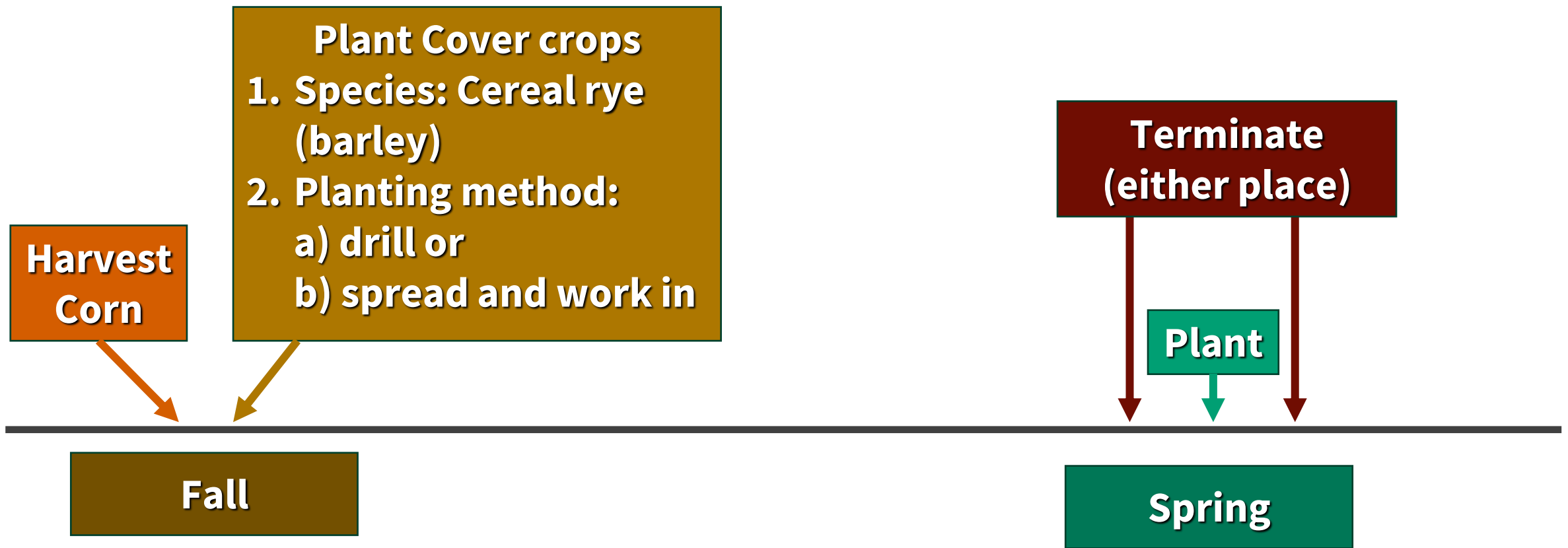
	No Cover Crop	Overwintering
Number of fields	3,750	918
Yield per acre	70	68
Soil Productivity Rating	140	139
Gross Revenue	\$717	\$710
Total Non-land Costs	\$278	\$311
Operator & Land Return	\$439	\$399

Yield difference is a tillage impact.

- No-till has lower yields than tillage systems
- More cover crop fields are no-till

Non-land costs increase because of planting and seeding costs of cover crops

Experience with
TOP 25%
profitable fields
with cover crops



Notes:

- 1) Preparation and planting costs are around \$30 per acre - **Seed (\$15) and drill/tillage (\$15)**
- 2) Termination costs don't vary from no cover crop to cover crop fields
- 3) There is a yield advantage to planting early
- 4) No statistical difference in yield difference between cover crop and no cover crops (time ?)
- 5) Cover crop need to lower costs, with most potential coming from lowering herbicide cost

Soybeans: Over-winter Cover Crops

What we see more of in the most profitable 25%

- Cereal rye (true also in low 25%), barley is next
- Drilled number 1 application system
(followed by broadcast with fertilizer, one-till pass)
- \$25 per acre less in pesticide costs

Cover Crops

Corn, High SPR, Average from 2015 to 2022

	No Cover Crop	Overwintering	Winter Terminal
Number of Fields	4,502	380	164
Yield per Acre	222	215	217
Soil Productivity Rating	140	139	140
Gross Revenue	\$938	\$922	\$918
Total Non-land Cost	\$543	\$598	\$572
Operator & Land Return	\$395	\$324	\$346

Cover Crops Going into Corn

- Much more divergent practices in top 25%
 - Many use two or more species, single species is still predominated by cereal rye
 - Many more with terminal cover crops
 - More tillage, either strip till or one-pass light
- Less of a formula for cover crops before corn

Cover Crop Funding Opportunities



College of Agricultural,
Consumer &
Environmental Sciences

UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

farmdoc

Megan Miller



Types of cover crop funding

Public

Federal: USDA Farm Bill Programs, IRA,
Partnerships for Climate Smart Commodities

State: Fall Covers for Spring Savings & Partners for Conservation

Private

Pay for practice or carbon/ecosystem service markets

Combination funding

PCM specific
 Cover Crop
 RCPP funding
 available in 20
 Illinois counties



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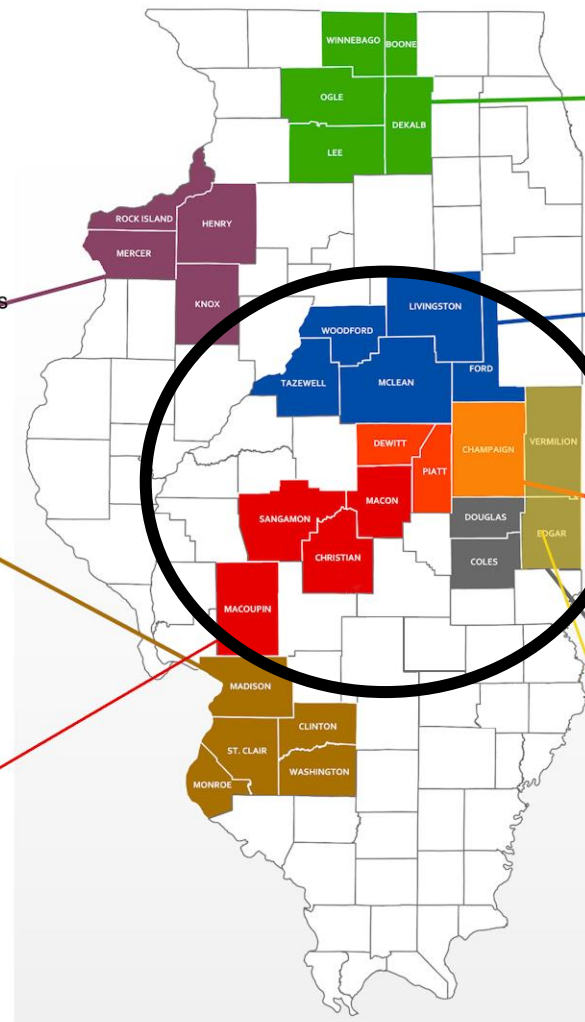
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Incentive Programs

- Payments coming from USDA and PepsiCo/Walmart
- PepsiCo and Walmart sharing claim on the carbon asset



Field to Market[®]

The Alliance for Sustainable Agriculture



2023 PAYMENT STRUCTURE

COVER CROPS	NO-TILL/STRIP-TILL	MRTN/10% NITROGEN REDUCTION
\$15, 1st/2nd year	\$10, 1st/2nd year	\$10, 1st year
\$10, 3+ year OLD	\$5, 3+ year OLD	–
	\$25, 1st/2nd year NEW	\$15, 3+ year OLD
\$20, 1st/2nd year	\$15, 3+ year OLD	–
		\$15, 1st/2nd year



PEPSICO

Incentive Programs

Transition Incentive Payments (TIP)

NEW cover crop acres

- \$25/acre Year 1
- \$15/acre Year 2
- \$10/acre Year 3
- Can enroll up to 1,000 acres/farmer
- Look back period for eligibility is 1 year
(i.e. if field was not cover cropped previous year, it is eligible as a “new” field/acre)

Signing Incentive Payments (SIP)

OLD cover crop acres

- \$2/acre payment for 1 year (up to 600 acres)
- Access to DTN’s Digital Marketplace connecting you to other ecosystem service opportunities



Additional Resources





Illinois Sustainable Ag Partnership's Cover Crop Incentive Stacking Matrix


ISAP's Cover Crop Incentive "Stacking Matrix" is designed to demonstrate opportunities for farmers to stack payments from multiple incentive programs. Programs that are claiming a farmer's carbon asset will be marked with an asterisk (*).

These programs and the relationships shown on this matrix are acre-specific, meaning the same acres enrolled in EQIP on your farm are in-eligible to receive payments from other federally funded programs. However, you can enroll separate tracts on your farm in different federally funded programs and receive payments that way. For federal programs, acreage is only eligible for financial assistance if there is an unaddressed resource concern that may be mitigated by using cover crops.

<https://ilsustainableag.org/resource/isaps-cover-crop-incentives-directory/>



Illinois Sustainable Ag Partnership's Cover Crop Incentive Stacking Matrix

	EQIP	CSP	RCPP	PFC	FCSS	PCCP	Champaign County Cover Crop Incentive	STAR Pfp	*ICCI	*PepsiCo Cover Crop Incentive Program	*PCM Soil Health Incentive	*SWOF
EQIP		X	X	X	X	✓	X	✓	✓	✓	✓	X
CSP	X		X	X	X	✓	X	✓	✓	✓	✓	X
RCPP	X	X		X	X	✓	X	✓	✓	✓	✓	X
PFC	X	X	X		X	✓	X	X	X	X	X	X
FCSS	X	X	X	X		✓	X	✓	✓	✓	✓	✓
PCCP	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Champaign County Cover Crop Incentive	X	X	X	X	X	✓		X	✓	✓	✓	X
STAR Pfp	✓	✓	✓	X	✓	✓	X		X	X	X	X
*ICCI	✓	✓	✓	X	✓	✓	✓	X		X	X	X
*PepsiCo Cover Crop Incentive Program	✓	✓	✓	X	✓	✓	✓	X	X		X	X
*PCM Soil Health Initiative	✓	✓	✓	X	✓	✓	✓	X	X	X		X
*SWOF	X	X	X	X	✓	✓	X	X	X	X	X	

*Programs that are claiming a farmer's carbon asset



ISAP's Cover Crop Seed Dealers Directory

Illinois Sustainable Ag Partnership's Cover Crop Seed Dealers Directory shares contact information, geography of service, and a list of available conservation cropping services provided by cover crop seed dealers in Illinois. The directory was developed to assist farmers in identifying cover crop seed dealers in their proximity who can supply cover crop seed and provide other services to support a farmer's transition to or management of a conservation cropping system.



Add your business to the directory or access a searchable, filterable version of this document by scanning the QR code or visiting ilsustainableag.org/cover-crop-seed-dealers-directory

ISAP does not endorse any particular program or company. Our goal is solely to share information among our farmer networks. The information in this directory was accurate at the time of publication (August 2023), but we encourage you to contact the service providers listed for the most up-to date information. If there is information in this directory that needs to be updated, please contact ISAP at hello@ilsustainableag.org

Business Name and Contact Info	Geography	Cover Crop Seed Services						Other Conservation Cropping Services									
		Cover crop seed sales	Cover crop seed & practice selection	Organic seed sales	Custom aerial seeding	Custom drill or broadcast seeding	Seed shipping	Cover crop termination	Nutrient application - N	Nutrient application - P	Variable rate nutrient application	Fertilizer application	Nutrient mgmt. planning	Regenerative grazing consult	Small grains/crop diversification consult	Pasture / grazing mixtures	Weed / pest control
Advance Cover Crops www.advancecovercrops.com 618-922-7446 adamdahmer@advancecovercrops.com	Southern IL	✓	✓				✓	✓									
Agassiz Seed and Supply www.agassizseed.com 701-282-8118 info@agassizsee.com	Statewide	✓	✓				✓						✓	✓	✓		
Albert Lea Seed www.alseed.com 800-352-5247 seedhouse@alseed.com	Statewide	✓	✓	✓			✓										
C. D. Ford & Sons, Inc www.cdford.com 309-944-4661 sheena@cdford.com	Central IL	✓	✓	✓			✓							✓	✓	✓	

An Overview of Voluntary Carbon Markets for Illinois Farmers

Illinois Sustainable Ag Partnership (June 2023)

15 Ecosystem Service Markets are available in Illinois



American Farmland Trust

Payment Types

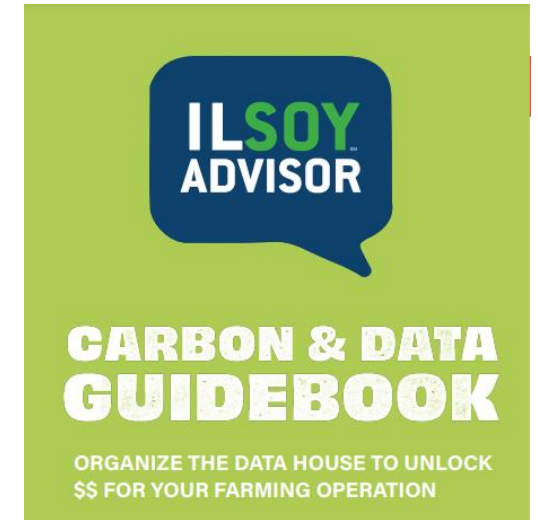
- Pay for Practice
- Pay for outcomes (per Tonnes of CO₂e)
- Pay for outcomes (per bushel)
- Combinations of
Pay for Practice
+ Pay for Outcome



How to prepare for program = enrollment?

- 1) **Understand your conservation goals**
- 2) **Its probably too early to enroll the whole farm**
Start with a few fields at a time
- 3) **Be prepared with good conservation agronomy**
Find a conservation agronomist to help you with your transition into conservation agriculture
- 4) **Get your data ready**
Records and data are the key to receiving the highest dollar for your work

<https://www.ilsoyadvisor.com/carbon-data-guidebook>



Pay attention to:

Contract length v land rental agreements

Will you be farming that field for the length of your contract?

Funding type

Inset, offset, ecosystem service, federal conservation program

Contract fine print

Understand the full terms of your agreement

Data usage

How will the carbon market use your data?

Pay attention to:

Verification methods

Receipt audits, field visits, modeling, satellites all common

Program Exclusion

Whether enrollment excludes the grower from participating in other markets or government programs

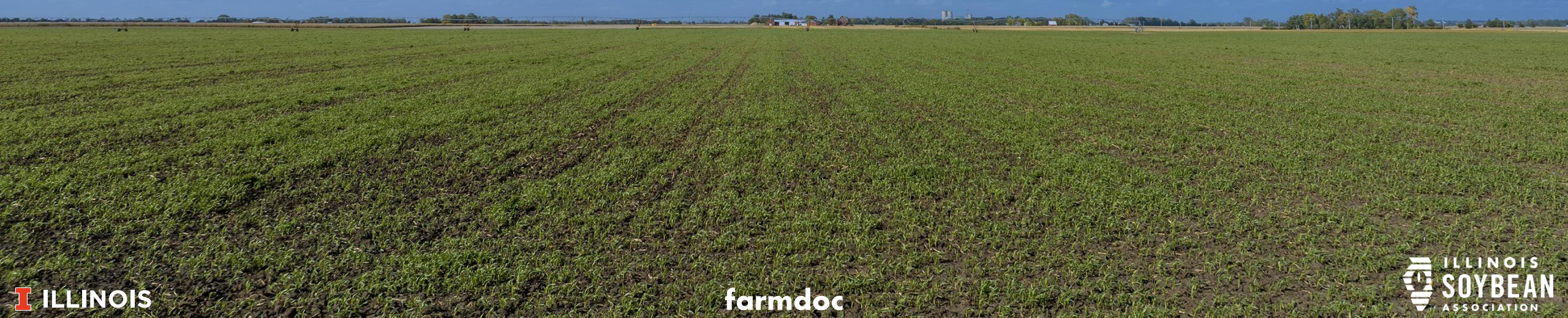
Cost-share programs

Many non-governmental cost share programs are now associated with a carbon asset

Pay attention to:

Practice standards

If enrolling in a federally funded program (e.g. Climate-Smart or EQIP) don't assume they all have the same planting standards and program requirements



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Department of
Agricultural &
Consumer Economics

Extension





Thank You for joining us!

Please submit your questions

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