

2015-2021 DATA SUMMARY

The Business Case for Conservation

Cost-Benefit Analysis of Conservation Practices



Precision Conservation Management

Table of Contents

3

Farm Incomes & Environmental Outcomes

4

Achieving Conservation Goals

6

Tillage Data

8

Cover Crop Data

10

Nitrogen Data

12

Farmer Testimonials

13

How The Data Stacks Up

14

Most Profitable Fields

16

Should You Consider A Different Strategy?

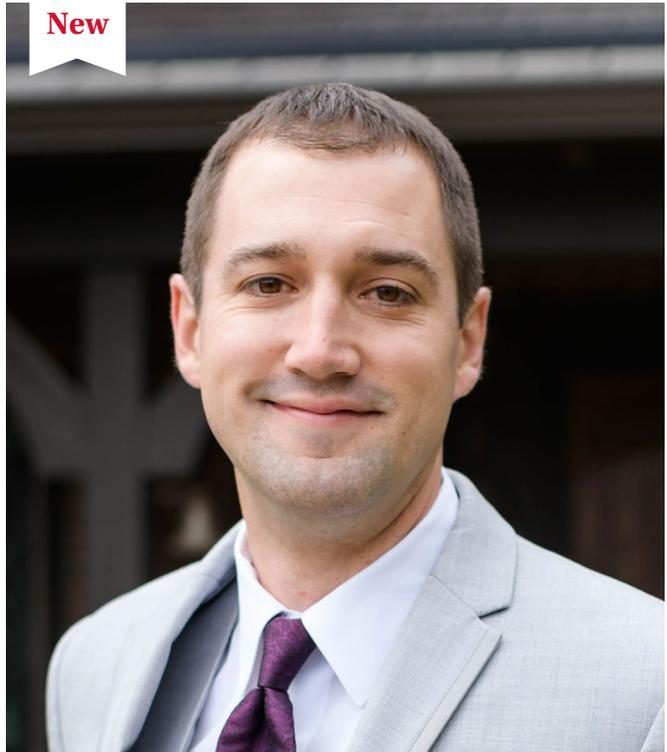
17

There's Never Been A Better Time

18

PCM Specialists & PCM Professionals

New



Greg Goodwin

Greg joined the PCM team in February 2022 and oversees the entirety of the program and its operations. In his previous role at Waterborne Environmental, Greg helped farmers understand how their management practices impacted our environment. He holds an M.S. in agricultural engineering focused in soil and water resources from the University of Illinois and just welcomed his first child in April. Greg grew up on a small family-owned farm in Crawford County, IL.



I love farming because of how foundational it is to everything we enjoy as a modern society. I am grateful and honored to have the privilege to work on the issues and challenges that face this industry and support the individuals who grow our food.

Farm Incomes & Environmental Outcomes

The Precision Conservation Management (PCM) program was created by farmers, for farmers, to assist in the evaluation of on-farm conservation decisions.

The program began with a USDA Regional Conservation Partnership Program (RCPP) award in 2015. Since that time, the program has expanded to seven regions in Illinois, one in Kentucky, and one in Nebraska.

The objective of PCM is to work one-on-one with farmers to help them understand the costs and benefits

of adopting new conservation practices for their unique farm business. By joining PCM, farmers agree to allow PCM to aggregate and anonymize their data in a way that demonstrates how conservation practices affect environmental outcomes and farm incomes of real farmers in Illinois. The advantage of PCM to individual farmers is that they have their own PCM specialist who helps them incorporate conservation practices into their short- and long-term farm business planning.



NOTE FOR THE READER:

To truly utilize the economic benefit of conservation practices, you must suspend the belief that higher corn and soybean yields equal increased profitability. As farm organizations, we believe this quest for higher yields has been “baked” into farmers’ psyche for generations. We’d like to challenge readers to consider that obtaining high yields, and the higher input costs that goal often requires, may not be the best economic or conservation model for Illinois farms and Illinois farm families.

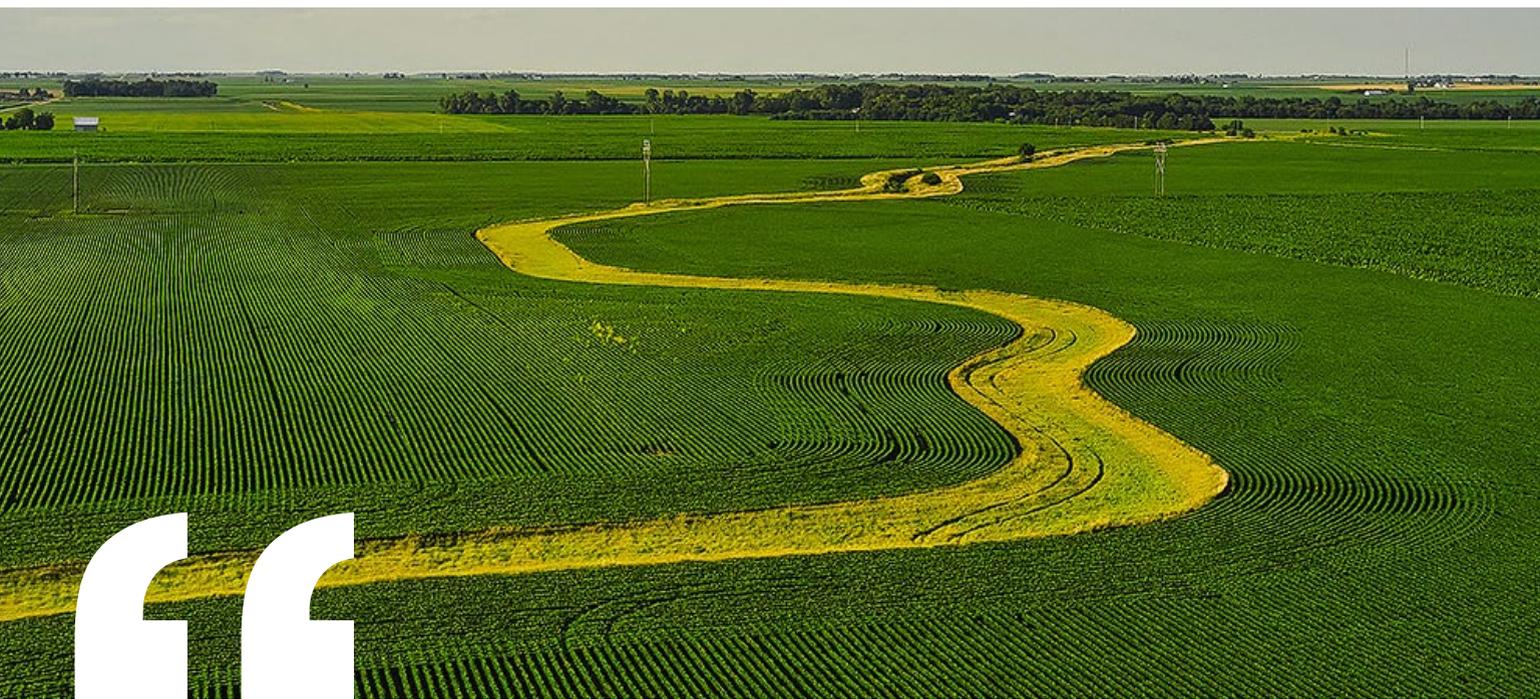
Achieving Conservation Goals 4

Precision Conservation Management operates in specific counties in targeted watersheds in Illinois, Kentucky, and Nebraska. (See page 18.)

We designed PCM to be able to impact 100% of the corn and soybean acres in Illinois, even if we can't work directly

with every farmer in the state. By joining PCM, farmers agree to allow us to make their aggregated, anonymized data available to other farmers across Illinois and the Midwest to impact their own family farms.

In order to meet the goals of the Illinois Nutrient Loss Reduction Strategy, at least one additional conservation practice must be implemented on every acre of farmland in Illinois. Use this data and the recommendations that follow to consider what your newest conservation practice should be.



Adam Brown
MACON COUNTY, ILLINOIS

By utilizing PCM data, I've been able to find my farm's economic threshold, turning fewer inputs into more profit. Through consultations with my PCM Specialist and capitalizing on incentive dollars, I've become more comfortable trying new stewardship methods. With PCM trendline data in place, I understand where my farm operation has been and can better formulate a plan for where it is going. Ultimately, it's my job to leave this land better than the way I found it. PCM is a good partner in that endeavor.

PCM relies on an extensive set of team members, including the University of Illinois (U of I), the Illinois Farm Business Farm Management Association, and Heartland Science & Technology Group, to aggregate, assess, and compare how farmers using more conservation-focused management practices fare financially against farmers using more conventional methods.

Farmers enrolled in PCM work with their specialist to enter and securely store their farm management data on PCM’s data collection platform, built by Heartland Science & Technology Group. A custom report is created for each farmer every year, documenting their farm’s environmental and financial assessments. Reports are delivered by PCM specialists to farmers in February and March.

At this meeting, farmers and specialists consider the strengths and weaknesses represented in the report, along with opportunities from PCM partners for cost-share or ecosystem asset payments that can help farmers confidently begin the transition toward farming systems that reduce nutrient losses and build soil health over time.

All the data in this book compares high SPR fields. Soil Productivity Ratings are defined by soil type (series) according to the U of I Bulletin 811. Fields with an acre-weighted average SPR value greater than or equal to 130 are considered “high productivity” and values below 130 are considered “low productivity.”



Field to Market®



NOTE: PCM partners with Field to Market and the COOL Farm Alliance to generate objective environmental impact estimates for our farmers’ agronomic decisions and with Dr. Gary Schnitkey, ag economist, University of Illinois, for financial estimates.



As in previous years, we see that the 2-Pass Light Tillage class remains the most profitable tillage system for corn grown on high-productivity soils in our PCM regions. The second tillage pass with a light piece of tillage equipment, like a cultivator or vertical-till implement, produced enough additional corn to pay for itself.

However, a second pass with a heavier tillage implement (as seen in the 2-Pass Moderate class) did not produce enough extra corn to be more profitable than using a single tillage pass.

Most important to note, more than two tillage passes is never the most profitable tillage system for any crop in any year that we've analyzed to date. Even if a farmer produces a higher yield with this management system, the few extra bushels did not pay for the additional pass(es).



Please also notice that soil loss on no-till and strip-till acres is substantially less than for any full-width tillage class, indicating that there is a longer-term gain in no-till

and strip-till systems, which might not be showing itself in our seven-year dataset.

Corn TILLAGE HIGH SPR 2015-21 AVG VALUES	NO-TILL	STRIP-TILL	1-PASS LIGHT	2-PASS LIGHT	2-PASS MODERATE	2+ PASSES
# of fields	590	731	1,312	442	638	88
Yield per acre	213	218	219	225	225	218
GROSS REVENUE	\$826	\$845	\$851	\$876	\$873	\$845
TOTAL DIRECT COSTS*	\$390	\$402	\$385	\$393	\$397	\$410
Field work	\$0	\$20	\$11	\$22	\$26	\$38
Other power costs	\$101	\$95	\$98	\$96	\$96	\$99
TOTAL POWER COSTS**	\$101	\$115	\$109	\$118	\$122	\$137
OVERHEAD COSTS	\$37	\$37	\$37	\$37	\$37	\$37
TOTAL NON-LAND COSTS	\$528	\$555	\$531	\$548	\$556	\$585
OPERATOR & LAND RETURN	\$298	\$290	\$320	\$328	\$317	\$260
Estimated soil loss (tons/a)	0.55	0.52	1.12	1	1.03	1.39
GHG emissions (metric tons CO ₂ e/a)	-0.32	0.31				1.16

***Direct Costs** = fertilizers, pesticides, seed, cover crop seed, drying, storage, and crop insurance

****Power Costs** = tillage, fall fertilizer application, spraying, planting, cover crop planting, spring/in-season fertilizer application, harvesting, and grain hauling

No-Till = No tillage; **Strip-Till** = Less than full-width tillage of varying intensity; **1-Pass Light** = 1 pass w/low-disturbance tillage; **2-Pass Light** = 2 passes w/low-disturbance tillage; **2-Pass Medium** = 2 passes (1 low-disturbance tillage +1 high-disturbance tillage); **2+ Pass** = more than 2 tillage passes, any intensity level

SPR = soil productivity rating



Cover Crop Data

This dataset is probably not convincing for farmers who want to plant cover crops but don't want to lose money. We understand. However, we continue to present the data and promote cover crops because growing cover crops has the most positive impact on reducing nutrient losses, soil erosions, and greenhouse gas emissions relative to other conservation practices. These issues are important today and will become increasingly important in the future.

For those farm fields that you own, you might consider

the investment you're making in your own property by reducing soil erosion and building soil organic matter with cover crops. If you farm rented acres, does the landowner have any interest in natural resource issues? If so, you might talk with them about sharing the expense of cover crop adoption. Illinois Corn Growers Association (ICGA) has worked with faculty from the University of Illinois to develop Conservation Lease Addendums for Illinois farm leases. Addendums can be used to guide conversations about conservation practices and clarify duties and responsibilities. These documents are

Corn COVER CROPS			
HIGH SPR 2015-21 AVG VALUES	OVERWINTERING	WINTER TERMINAL	NO COVER CROP
# of fields	243	109	3,523
Yield per acre	214	215	221
Soil Productivity Rating	139	139	140
GROSS REVENUE	\$833	\$834	\$856
COVER CROP SEED	\$13	\$13	\$0
TOTAL DIRECT COSTS*	\$395	\$374	\$393
COVER CROP PLANTING	\$12	\$16	\$0
Other power cost	\$117	\$106	\$112
TOTAL POWER COSTS**	\$129	\$122	\$112
OVERHEAD COSTS	\$37	\$37	\$37
TOTAL NON-LAND COSTS	\$562	\$533	\$543
OPERATOR & LAND RETURN	\$241-\$291	\$275-\$325	\$313
Estimated soil loss (tons/a)	0.64	0.67	0.93
GHG emissions (metric tons CO2e/a)	-0.72		0.30

*Direct Costs = fertilizers, pesticides, seed, cover crop seed, drying, storage, and crop insurance

SPR = soil productivity rating

available on the U of I Extension farmdoc daily website; just search for “conservation lease addendum Illinois” in your web browser.

Remember as you review PCM cover crop data: We are not presenting this information as a best-case scenario. The number of cover crop acres in our dataset is relatively low and the farmers growing the cover crops are often relatively inexperienced. Also, most of the farmers in the PCM program growing cover crops are receiving some sort of financial assistance, which is not reflected in the

net returns published here. These cost-share payments often make the cover crop practice profitable, or at least not a loss.

Investing in soil health is one of the best opportunities for Illinois farmers to become more resilient and more able to handle the intense rainfall events many of us are experiencing each spring. Healthy soils can absorb and retain moisture, resist compaction, and overall offer a buffer to significant weather events that will benefit Illinois farmers.

Soybeans COVER CROPS			
HIGH SPR 2015-21 AVG VALUES			
	OVERWINTERING	WINTER TERMINAL	NO COVER CROP
# of fields	588	28	3,066
Yield per acre	68	68	70
Soil Productivity Rating	139	139	140
GROSS REVENUE	\$666	\$675	\$686
COVER CROP SEED	\$13	\$13	\$0
TOTAL DIRECT COSTS*	\$158	\$159	\$151
COVER CROP PLANTING	\$10	\$16	\$0
Other power costs	\$90	\$70	\$84
TOTAL POWER COSTS**	\$100	\$86	\$84
OVERHEAD COSTS	\$31	\$31	\$31
TOTAL NON-LAND COSTS	\$290	\$276	\$266
OPERATOR & LAND RETURN	\$344-\$394	\$373-\$423	\$420
Estimated soil loss (tons/a)	0.96	1.03	1.29
GHG emissions (metric tons CO2e/a)	-1.76		-0.28

**Power Costs = tillage, fall fertilizer application, spraying, planting, cover crop planting, spring/in-season fertilizer application, harvesting, and grain hauling

Nitrogen Data

Over the past 12 months, input costs and, most especially, nitrogen fertilizer prices have soared to never-before-seen levels and have become glaring concerns for everyone working in agriculture. Minimizing nitrogen costs for corn production could mean the difference

between profit and loss in coming years. It might also provide significant water quality wins.

Here's what we know: Nitrogen application rates greater than Maximum Return to Nitrogen (MRTN) are never

Corn N-TIMING HIGH SPR 2015-21 AVG VALUES	>40% FALL	MOSTLY PREPLANT	MOSTLY SIDEDRESS	50% PREPLANT/ 50% SIDEDRESS	3-WAY SPLIT
NUE (lb N/bu grain)	0.98	0.92	0.91	0.95	0.93
# of fields	1,428	841	933	310	363
Yield per acre	220	218	221	218	222
GROSS REVENUE	\$854	\$844	\$857	\$843	\$860
N fertilizer	\$82	\$78	\$76	\$88	\$83
Other direct costs	\$320	\$292	\$308	\$311	\$328
TOTAL DIRECT COSTS*	\$402	\$370	\$384	\$399	\$411
Field work	\$16	\$15	\$16	\$15	\$17
Other power costs	\$100	\$92	\$97	\$97	\$99
TOTAL POWER COSTS**	\$116	\$107	\$113	\$112	\$116
OVERHEAD COSTS	\$37	\$37	\$37	\$37	\$37
TOTAL NON-LAND COSTS	\$555	\$515	\$535	\$548	\$564
OPERATOR & LAND RETURN	\$299	\$329	\$322	\$295	\$296

*Direct Costs = fertilizers, pesticides, seed, cover crop seed, drying, storage, and crop insurance

SPR = soil productivity rating

**Power Costs = tillage, fall fertilizer application, spraying, planting, cover crop planting, spring/in-season fertilizer application, harvesting, and grain hauling

more profitable for corn production on high SPR soils in our PCM regions, even when it results in additional yield. The high cost of nitrogen fertilizers can only make this observation true to a greater degree unless corn prices rise dramatically.

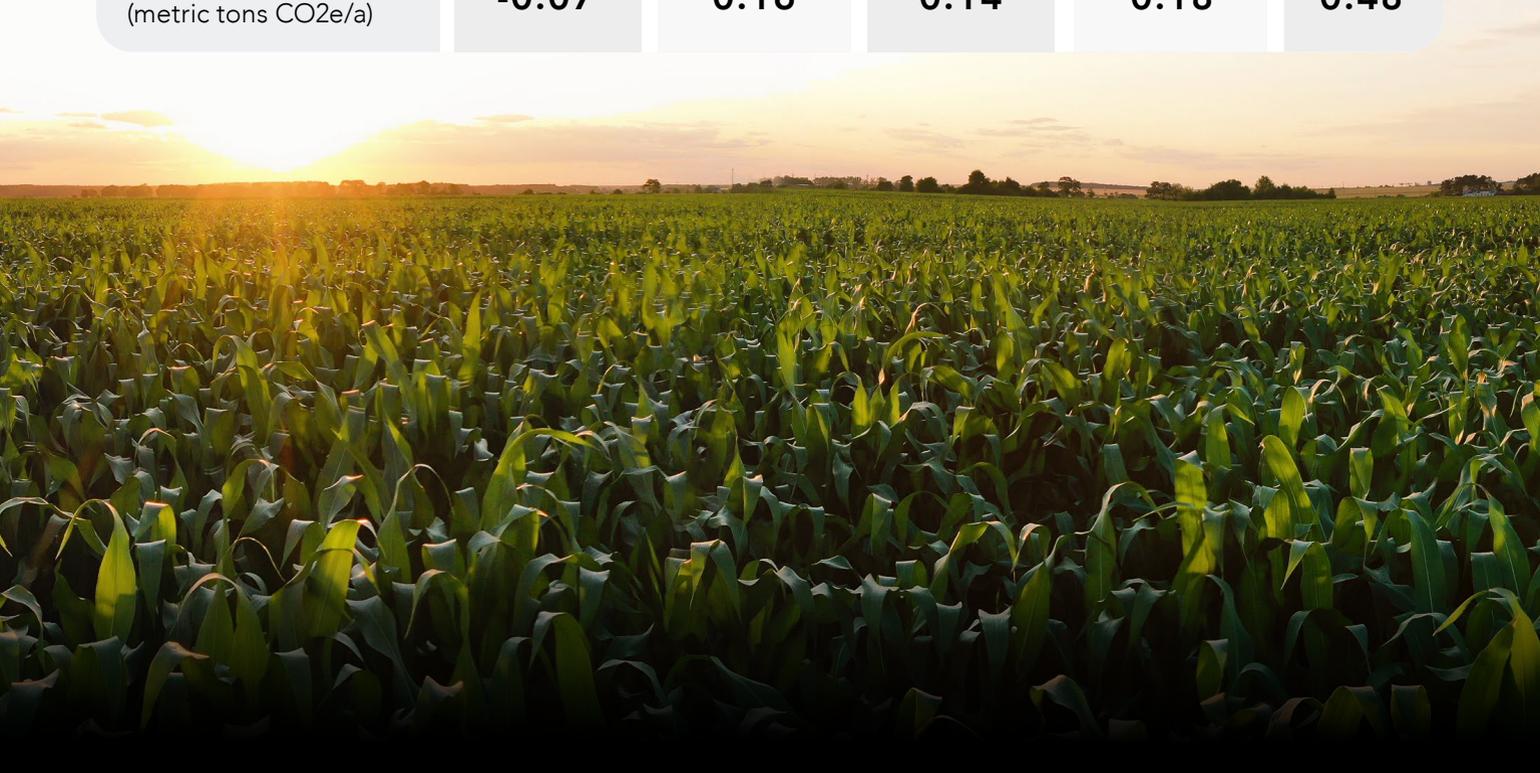
Applying the majority of nitrogen fertilizer in the fall is also consistently a least-profitable practice in the PCM

dataset. Saving the additional cost of stabilizer is another reason to consider applying nitrogen fertilizer in season, when possible.

The Maximum Return to Nitrogen is the University of Illinois (U of I) recommended nitrogen (N) rate decision tool for corn production in Illinois. Learn more at cnrc.agron.iastate.edu.

About 70% of PCM farmers are applying nitrogen at rates above the MRTN guidelines. Our analysis shows that corn grown on high SPR fields was most profitable when the total nitrogen application rate was in the MRTN range of 160-195 pounds.

Corn N-RATE HIGH SPR LBS PER ACRE	<150	151-175	176-200	201-225	>225
# of fields	103	348	1,121	1,478	825
AVG Corn Yield (bu/a) 2015-21	204	214	217	219	228
OPERATOR & LAND RETURN (2015-21)	\$297	\$319	\$318	\$307	\$307
GHG emissions (metric tons CO2e/a)	-0.07	0.16	0.14	0.18	0.48





“The biggest payoffs we’ve seen working with PCM are the ability to benchmark, the actual, tangible results that you get back, and having a partner available to assist with the process. PCM has helped us with all the new practices we wanted to implement but were too uncomfortable to take on by ourselves. Having the assistance of PCM has sure been a big help in the process.”

Jason Watson
VILLA GROVE, ILLINOIS

“We’ve enjoyed working with PCM because of the fact that it allows us to compare what we’re doing in our operation to other growers in our state and in our immediate area. That allows us to track how we’re succeeding with our regenerative farming program against other no-tillers and cover-croppers.”

Brad Reddick
BARDWELL, KENTUCKY





REDUCED TILLAGE

118,418

NITRATE-N (LBS NO3-N)

578,550

NITROGEN
MANAGEMENT

125,081

PHOSPHORUS (LBS P)

84,040

COVER CROPS

36,080

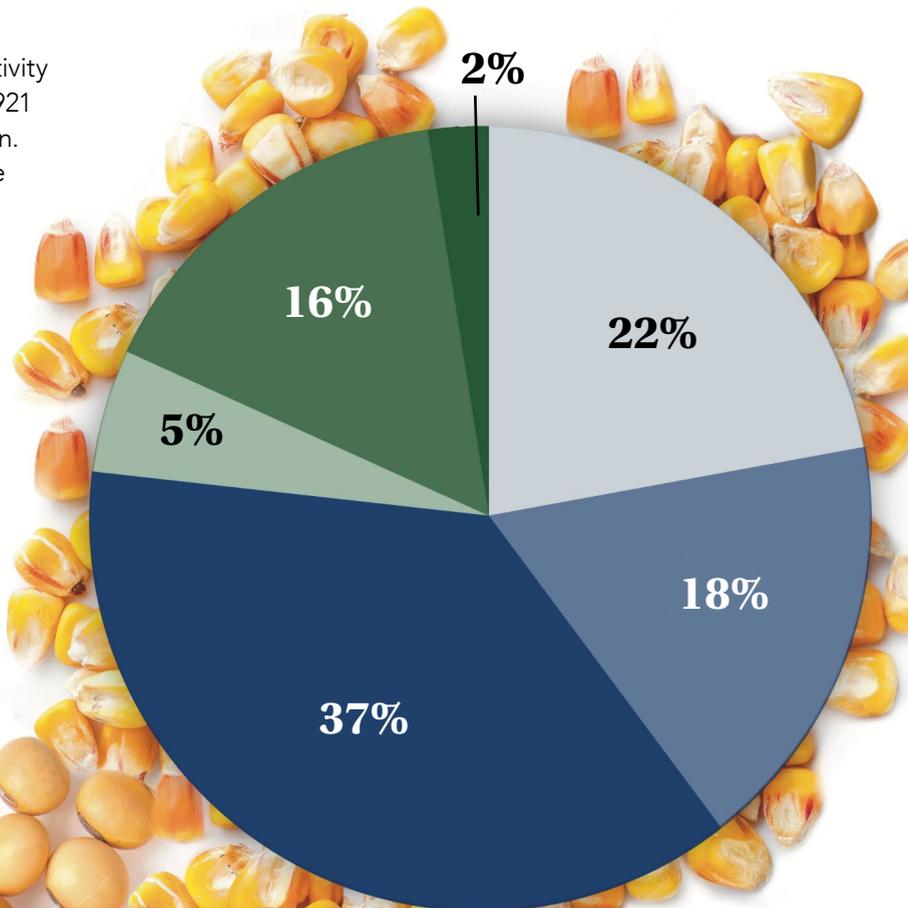
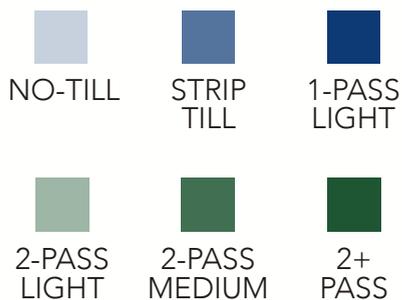
SEDIMENT (TONS)

124,875

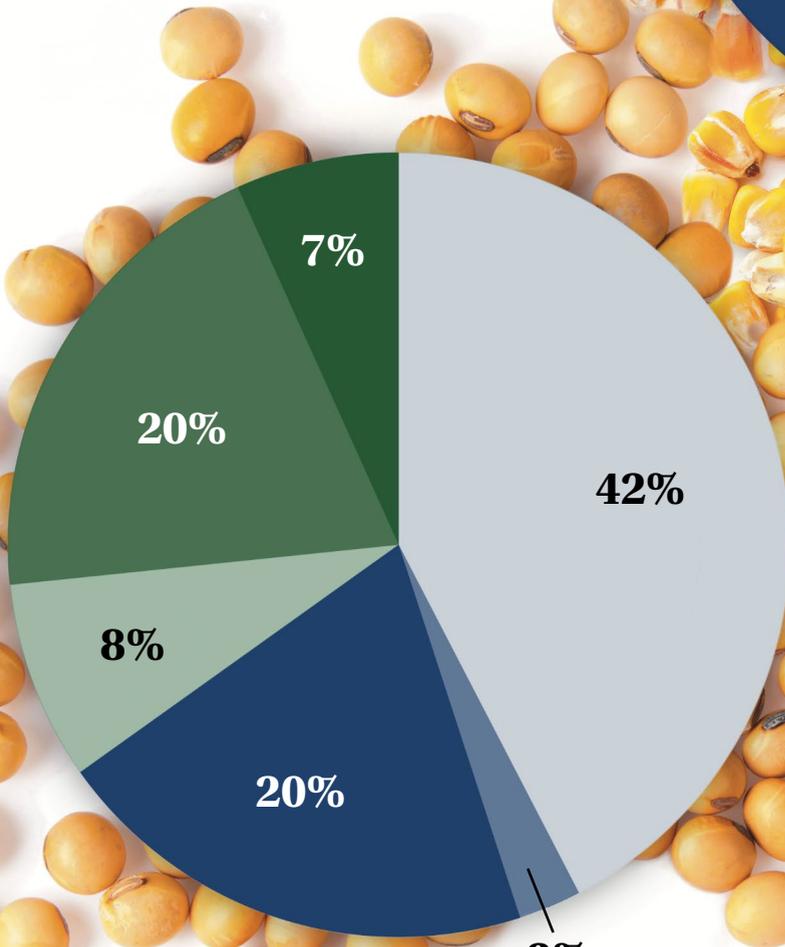
NOTE: Average net financial returns were much greater in 2021 than previous years for corn and soy. For corn, net return was 113% greater than the average of previous years (\$589 vs. \$276). For soy, net return was 46% greater than the average of previous years (\$597 vs. \$409).

Most Profitable Fields

The top 25% of all the fields with high productivity soils in our database (969 corn fields and 921 soybean fields) have some things in common. They mostly utilize no-till or one light tillage pass systems and they apply lower amounts of nitrogen fertilizer, largely in the spring.



▲
CORN
 HIGH SPR
 TILLAGE
 2015 – 2021



◀
SOYBEAN
 HIGH SPR
 TILLAGE
 2015 – 2021

Quick Facts

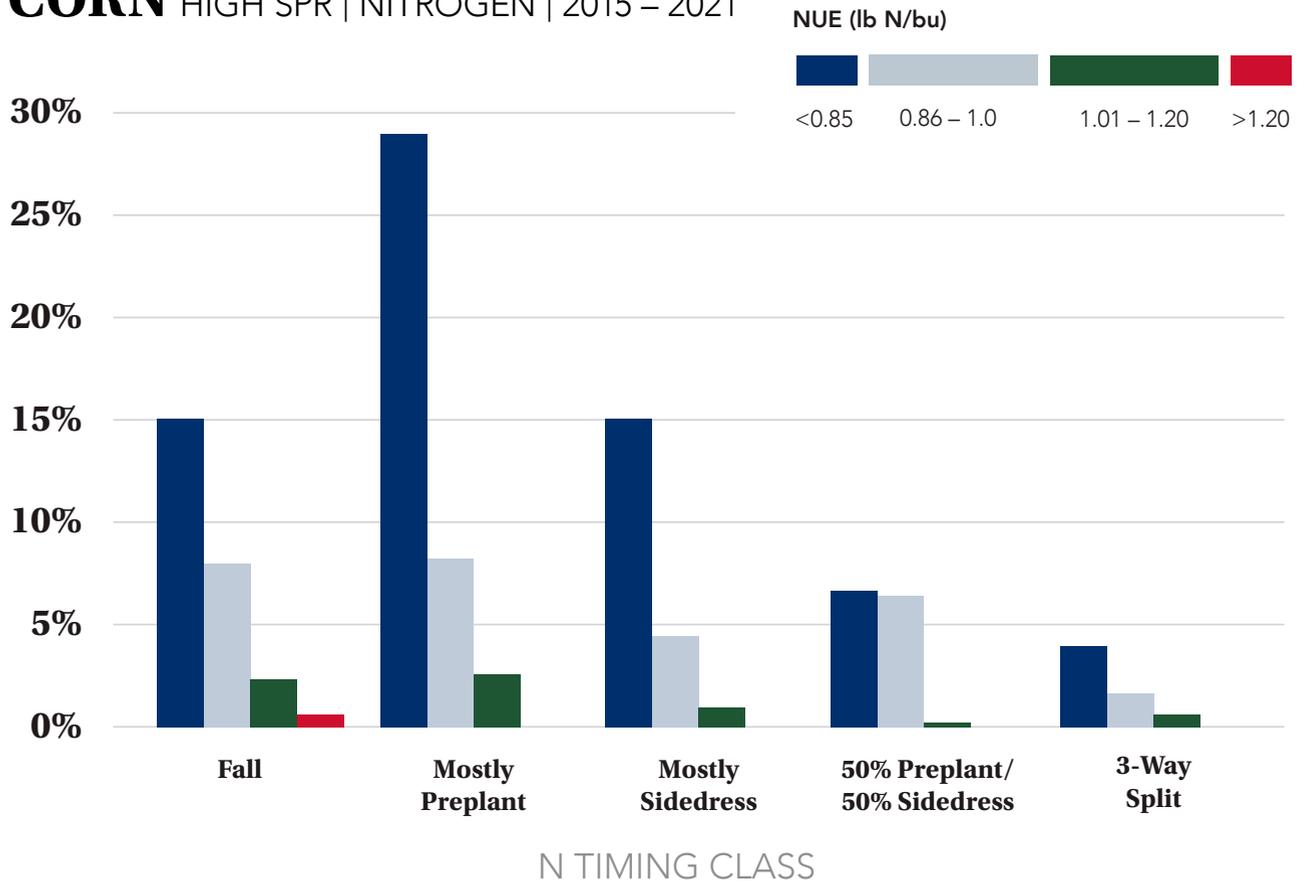
70% OF FARMERS IN THE PCM DATASET APPLY NITROGEN FERTILIZER AT RATES ABOVE THE MRTN RANGE

70% OF THE MOST PROFITABLE HIGH SPR CORN FIELDS IN PCM HAVE A NITROGEN USE EFFICIENCY VALUE LESS THAN 0.85 LB N PER BUSHEL OF CORN

70% OF THE MOST PROFITABLE HIGH SPR CORN FIELDS IN PCM APPLY NITROGEN EXCLUSIVELY IN SEASON

CORN HIGH SPR | NITROGEN | 2015 – 2021

MOST PROFITABLE FIELDS, % OF TOTAL



Should You Consider a Different Strategy?

Are you following MRTN nitrogen application guidelines?

Change it up and consider applying between 160 and 195 pounds of nitrogen per acre. Every year of our dataset shows that nitrogen application over MRTN is unprofitable.

Are you fall-applying nitrogen?

The most profitable acres in our dataset are utilizing preplant and sidedress nitrogen applications at MRTN levels.

Are you utilizing minimal tillage?

No matter your tillage management, consider one less pass this coming year. The most profitable systems in this dataset are utilizing 1-Pass Light or 2-Pass Light tillage. No-till and strip-till have the most significant positive environmental impact.

Are you utilizing heavy tillage?

More than two passes of heavy tillage is never profitable compared to other tillage management systems in our dataset. Consider adding some lighter tillage passes this year.

Have you tried cover crops on any of your acres?

Consider applying for a cover crop cost-sharing opportunity like ICGA's cover crop coupon and try the practice on a few acres.



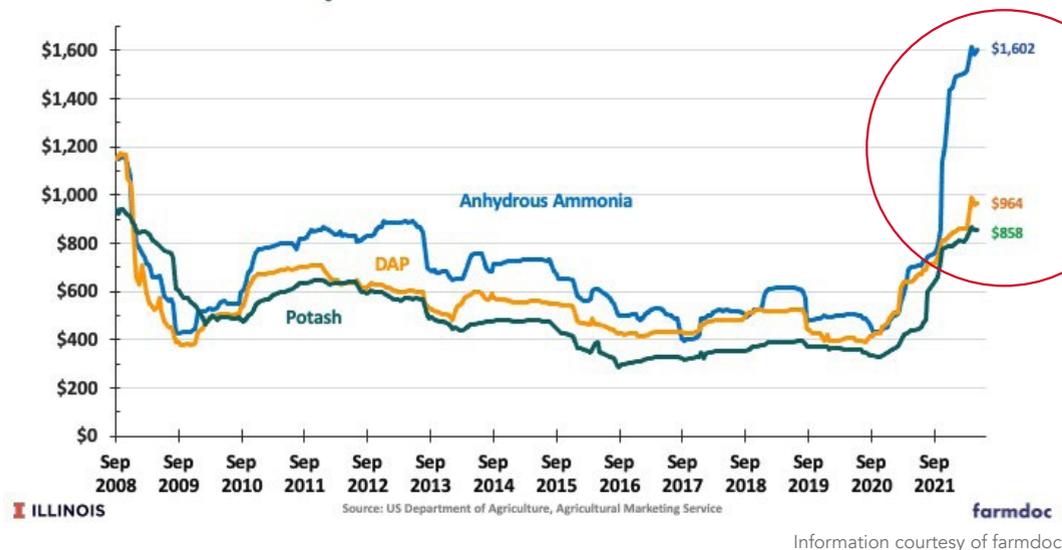
PCM and our partners are offering PCM farmers a way to reduce your risk when you try new conservation practices with these three (pretty awesome, if we say so ourselves) new programs, exclusive to PCM farmers!

3 Reasons To Make This Year THE YEAR

① MRTN-Linked Crop Insurance Buy-Up Program

Think dropping your N rate to the MRTN is too risky? There are seven years of PCM data that refute that idea, BUT if you still need a little insurance . . . try this new program. Offered EXCLUSIVELY to PCM farmers, PepsiCo will give you \$10/acre to “buy up” your crop insurance to a higher coverage level (from 80% to 90% coverage, for instance) in exchange for reducing your nitrogen fertilizer rate to the MRTN range.

Fertilizer Prices per Ton in Illinois From 2008 to 2022



Think about it!

Fertilizer prices are at record levels. Reduce your N fertilizer costs and get more insurance coverage for ANY yield-reduction event with PepsiCo’s insurance “buy up” program.

② No-Till or Strip-Till Cost Share – \$10/Acre

Did you know that 40% of the most profitable corn fields in the PCM dataset (high SPRs) are produced with no-till or strip-till? Yes, for corn! If you have been considering strip-till, this is a great way to give it a shot and get \$10/acre back. This offer is available for soybean fields, too.

③ Cover Crop Cost-Share Opportunities

PCM farmers have LOTS of options to get \$10-\$35 per acre for trying cover crops. Do you think cover crops could help with your water infiltration issues? Or do you have a field you know would benefit from the extra year-round ground cover? Or maybe you just want to see what all the fuss is about! You can try it out on one or two fields to get your feet wet. This fall would be a great time to work with your PCM specialist to seed a cover crop. We have all the connections and recommendations that you need.



Lou Liva | lliva@precisionconservation.org
309.391.2346
Rock Island, Mercer, Knox, & Henry Counties



Frank Rademacher | frademacher@precisionconservation.org
309.336.0765
Piatt, DeWitt, & Macon Counties



Alexa Rutherford | arutherford@precisionconservation.org
309.336.9779
Ogle, Lee, DeKalb, Boone, & Winnebago Counties



Shane Sinclair | ssinclair@precisionconservation.org
309.445.5017
Christian, Macoupin, & Sangamon Counties



Aidan Walton | awalton@precisionconservation.org
309.391.2345
Livingston, McLean, Tazewell, & Woodford Counties



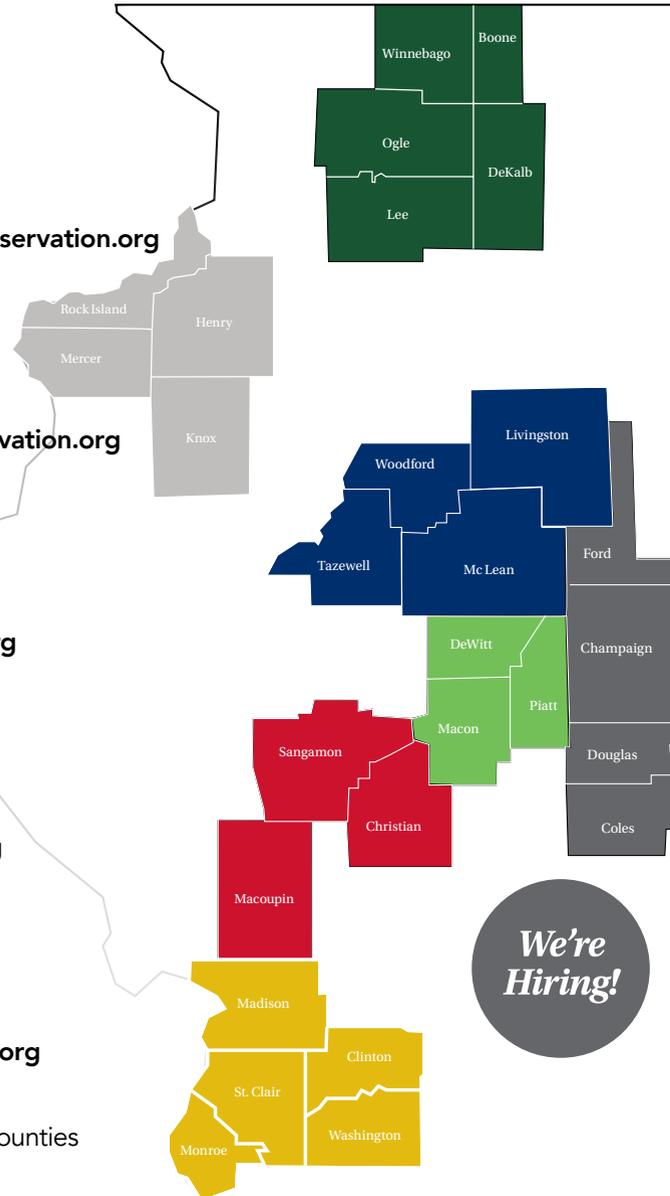
Andrea Kohring | akohring@precisionconservation.org
309.319.8809
Monroe, St. Clair, Madison, Clinton, & Washington Counties



Chris Stewart | cstewart@precisionconservation.org
270.205.2258
Select Counties in Kentucky



Darren Cudaback | dcudaback@precisionconservation.org
308.216.1153
Select Counties in Nebraska



We're Hiring!

Kent Bohnhoff

kbohnhoff@precisionconservation.org
PCM Enrollment Specialist



Greg Goodwin

ggoodwin@ilcorn.org
309.557.3257

Director of Precision Conservation Management



Dr. Laura Gentry

lgentry@ilcorn.org
217.244.9165

**Director of Water Quality Research, IL Corn
Adjunct Faculty, University of Illinois**



Megan Dwyer

mdwyer@ilcorn.org
309.557.3257

Director of Conservation and Nutrient Stewardship, IL Corn



Debra Malloch

dmalloch@ilcorn.org
309.557.3257

PCM Administrative Assistant, IL Corn



Abigail Peterson

apeterson@ilsoy.org
309.663.7692

Director of Agronomy, Illinois Soybean Assoc.



Jennifer Jones

jjones@ilsoy.org
309.663.7692

Agronomy Manager, Illinois Soybean Assoc.



Megan Miller

mmiller@ilsoy.org
309.663.7692

Agronomy Manager, Illinois Soybean Assoc.



Clay Bess

cbess@precisionconservation.org
309.445.0278

PCM Operations Manager





Precision Conservation Management

1605 Commerce Pkwy.
Bloomington, IL 61704

309.663.7692



14129 Carole Dr.
Bloomington, IL 61705

309.827.0912