Precision Conservation Management

COVER CROPS

Growing cover crops is a single management practice solution that addresses an assortment of management and natural resource challenges. For nutrient loss-related water quality issues, no in-field practice is more effective than cover crops, year in and year out. Cover crops also address soil erosion issues, builds soil organic matter, improves water infiltration, and encourages greater soil biological activity.

But how do cover crops affect crop yields and net farm profitability? From 2015 to 2018, PCM farmers grew over 30,000 acres of cover crops in Illinois and some of our initial findings are summarized below. Please recognize that there are as many ways to grow a cover crop as there are to grow a cash crop and there are as many ways to save money as there are to throw money away when growing cover crops. The data shown here is not meant to reflect the most profitable or best-case way to incorporate cover crops into your crop production system and many of the farmers represented in this data were growing cover crops for just the first or second time. Finally, please note that in the dataset shown here, the overwhelming majority of PCM farmers do not produce cover crops, which is reflective of the larger farming community. We are actively promoting cover crops in the PCM program and we offer many incentives ranging from cost share opportunities to technical support to encourage farmers who are interested in cover crops to use them successfully and profitably. In the fall of 2018, PCM farmers grew over 9,000 acres of cover crops using cost share assistance from PCM's corporate and conservation partners (PepsiCo, MARS, and The Nature Conservancy with a generous dollar-for-dollar match from the Council for Best Management Practices). We will be able to provide even more valuable cover crop data by this time next year. Please stay tuned!

YIELDS: As those who have worked with cover crops for a while know, there is a great deal of variability from year to year in growth of the cover crop as well as how it impacts the growth and yield of the cash crop. Cover crops were not correlated with reduced soybean yields regardless of soil type (Table A) and were found to reduce corn yields by as much as 5 bu/a (lower productivity soils) or by as much as 3 bu/a (higher productivity soils) (Tables B and C).

FINANCIALS: As seen in Table B, even though cover crops may not negatively affect crop yields, other costs associated with growing cover crops such as seed and planting costs and/or termination costs can result in reduced net profitability. The most profitable cover crop farmers, at least in the short term, are those who minimize seed and seeding costs for their cover crop applications. In the longer term, which we cannot address with the dataset developed here, many devoted cover crop farmers report substantially greater profits (relative to non-cover cropped fields) resulting from

increased cash crop yields following severe drought and storm events as well as the less-sporadic benefits of improved soil health and increased nutrient cycling.

Table A - Economic returns resulting from incorporating cover crops into soybean production systems in central Illinois from 2015-2018. All soil productivity ratings, combined.

PCM PROGRAM – IL 2015-2018 AVG VALUES	OVER-WINTERING COV CROP	WINTER TERMINAL COV CROP	NO COVER CROP
# Fields	*212*	*25*	*1876*
Yield per acre	*68*	*67*	*67*
Soil Productivity Rating	134	125	133
GROSS REVENUE	**$623**	**$619**	**$616**
Cover Crop Seed	*	*	$0
TOTAL DIRECT COSTS	**$146**	**$127**	**$137**
Cover Crop Planting	**	**	$0
TOTAL POWER COSTS	**$71**	**$74**	**$80**
OVERHEAD COSTS	**$30**	**$30**	**$30**
TOTAL NON-LAND COSTS	**$247**	**$231**	**$247**
OPERATOR & LAND RETURN	**$376*** **	**$388*** **	**$369**

Direct Costs = fertilizers, pesticides, crop 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
*Cost varies from $5-$40/acre
**Cost varies from $0-$15/acre
***does not include costs related to cover crop seed or planting

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Table B – Economic returns resulting from incorporating cover crops into corn production systems on lower productivity soils in central Illinois from 2015-2018.

PCM PROGRAM – IL 2015-2018 AVG VALUES	OVER-WINTERING COV CROP	WINTER TERMINAL COV CROP	NO COVER CROP
# Fields	*42*	*14*	*629*
Yield per acre	*194*	*211*	*199*
Soil Productivity Rating	122	114	118
GROSS REVENUE	**$686**	**$727**	**$699**
Cover Crop Seed	*	*	$0
TOTAL DIRECT COSTS	**$360**	**$344**	**$341**
Cover Crop Planting	**	**	$0
TOTAL POWER COSTS	**$104**	**$104**	**$106**
OVERHEAD COSTS	**$36**	**$37**	**$36**
TOTAL NON-LAND COSTS	**$500**	**$485**	**$483**
OPERATOR & LAND RETURN	**$186*** **	**$242*** **	**$217**

Direct Costs = fertilizers, pesticides, crop 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
*Cost varies from $5-$40/acre
**Cost varies from $0-$15/acre
***does not include costs related to cover crop seed or planting

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Table C - Economic returns resulting from incorporating cover crops into corn production systems on higher productivity soils in central Illinois from 2015-2018.

PCM PROGRAM – IL 2015-2018 AVG VALUES	OVER-WINTERING COV CROP	WINTER TERMINAL COV CROP	NO COVER CROP
# Fields	*60*	*26*	*1338*
Yield per acre	*218*	*219*	*221*
Soil Productivity Rating	139	141	140
GROSS REVENUE	**$756**	**$771**	**$780**
Cover Crop Seed	*	*	$0
TOTAL DIRECT COSTS	**$353**	**$328**	**$371**
Cover Crop Planting	**	**	$0
TOTAL POWER COSTS	**$104**	**$104**	**$108**
OVERHEAD COSTS	**$36**	**$36**	**$36**
TOTAL NON-LAND COSTS	**$493**	**$468**	**$517**
OPERATOR & LAND RETURN	**$263*** **	**$303*** **	**$263**

Direct Costs = fertilizers, pesticides, crop 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
*Cost varies from $5-$40/acre
**Cost varies from $0-$15/acre
***does not include costs related to cover crop seed or planting