

# Management and Conservation in the Face of Lower Returns

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# Habits of Resilient Farmers

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- **Presentation at 2017 IFES meetings (see farmdocDaily, January 10, 2018)**
- **Next slide shows summary slide from that presentation**

# Summary – From “Habits Seminar”

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- **Some farms outperform their peers consistently over time**
- **These farms tend to have higher revenues and lower costs**
  - **Revenues accounted for larger share of difference during high return period**
  - **Costs accounts for larger share of difference during lower return period**

# Rationale and Topics

## Rationale

- To get lower costs, highly resilient farmers did not over apply inputs. **This should have conservation benefits, particularly for nitrogen fertilizer.**
- Highly resilient farmers did not have lower yields
- Adopting “lower” input strategies may increase profits

## Topics

1. PCM – program for which data will be presented
2. Tillage
  1. Corn
  2. Soybeans
3. Nitrogen
  1. Method
  2. Rates
4. Cover crops

# Precision Conservation Management



- **2016: began enrolling farmers**
- **4 PCM regions in IL, 16 counties**
- **200 farmers enrolled in Illinois**
- **~200,000 acres, 1800 fields**



# **Illinois Corn Growers Association**

## **Illinois Corn Marketing Board**

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- **Precision Conservation Management is a program of Illinois Corn**
- **In response to nutrient management concerns**
- **University of Illinois (ACE) is providing support for the economic evaluation**

# Support structure



- **ICMB support**
- **Staff: Precision Conservation Specialists & Data Collection Representatives**
- **Partnership effort: 30+ partners**
- **NRCS RCPP award**
- **Web-based entry of information**

# PCM features & services

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- **Enrollment & data collection assistance**
- **Opportunities for financial and technical assistance**
- **Yearly personalized assessment report (RAAPs)**
  - **Financial & environmental assessments from U of IL faculty and supply chain tools**
  - **Meaningful comparisons using benchmark practice standards**





# Economic Report

Number of fields	928	952
	Com	Soybeans
SPR	134	134
Nitrogen applied -- total	210	2
-- in DAP/MAP	21	1
-- in Anhydrous Ammonia	93	0
-- in UAN	65	0
<b>Revenue</b>		
Yield per acre	205	65
Crop Revenue	714	613
ARC/PLC or ACRE	22	22
Crop Insurance		
Other Farm Receipts		
<b>Gross Revenue</b>	<b>735</b>	<b>635</b>
<b>Expenses</b>		
P, K and Lime	75	8
Nitrogen	62	0
Pesticides	46	40
Insecticides	1	1
Seed	121	57
Seed - cover crop	0	0
Drying	7	0
Storage	21	6
Crop Insurance	22	15
<b>Direct Costs</b>	<b>354</b>	<b>128</b>
Field work	15	14
Planting - crop	14	14
Planting - cover crop	0	1
Machine hire/lease/application cost	34	21
Harvest	36	32
<b>Power Costs</b>	<b>101</b>	<b>81</b>
<b>Overhead Costs</b>	<b>36</b>	<b>30</b>
<b>Total Non-Land Costs</b>	<b>491</b>	<b>240</b>
Operator and Land Return	244	395

- **Produced on each field in PCM**
- **Per field revenue and costs are**
  - Prepared using input (fertilizer, pesticides, etc.) and field operations
  - Standard commodity prices, input prices and field operation costs
- **Summaries prepared for**
  - Tillage
  - Nitrogen application and methods
  - Cover crops

# Tillage and Corn

Tillage Method	No of Fields *	SPR *	Yields				Opr and Land Return *
			2015	2016	2017	Average *	
			Bushels per acre				\$ per acre
No-till	124	133	183	204	210	199	231
Strip	124	137	187	221	212	207	252
1 pass	288	135	182	222	212	205	252
2 pass	371	134	197	216	212	209	244

\* Over three years.

Don't observe a yield advantage for 2 pass system

# Tillage and Soybeans

Tillage Method	No of Fields *	SPR *	Yields				Opr and Land Return *
			2015	2016	2017	Average *	
			Bushels per acre				\$ per acre
No-till	434	133	63	67	64	64	397
<b>1 pass</b>	<b>133</b>	<b>135</b>	<b>69</b>	<b>69</b>	<b>64</b>	<b>68</b>	<b>414</b>
2 pass	207	133	66	68	64	66	400
2+ pass	178	134	62	67	61	63	367

\* Over three years.

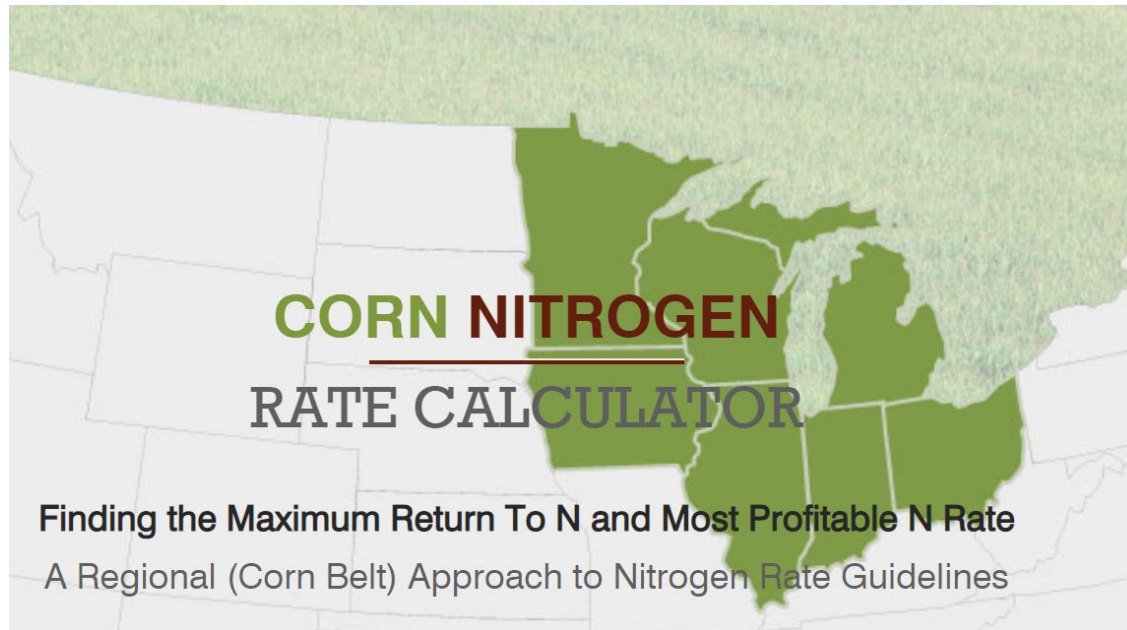
**One-pass systems has the highest yields and highest returns**

# Tillage Suggestions

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- **May think about cutting back on tillage, particularly in 2019 given that lower amounts have been done**
- **Experiment: Cut a tillage pass on portion of the field and evaluate**

# Nitrogen and the MRTN



<http://cnrc.agron.iastate.edu/>

## Rates for Maximum Return to N (MRTN)

- **166 lbs/acre for northern Illinois**
- **183 lbs/acre for central Illinois**
- **193 lbs/acre for southern Illinois**

## Based on input of

- **\$4.00 per bushel corn price**
- **\$525 per ton ammonia price**
- **Corn following soybean**
- **Done on 12/2/2018**

**Many farms put on higher rates**

# N Application Method

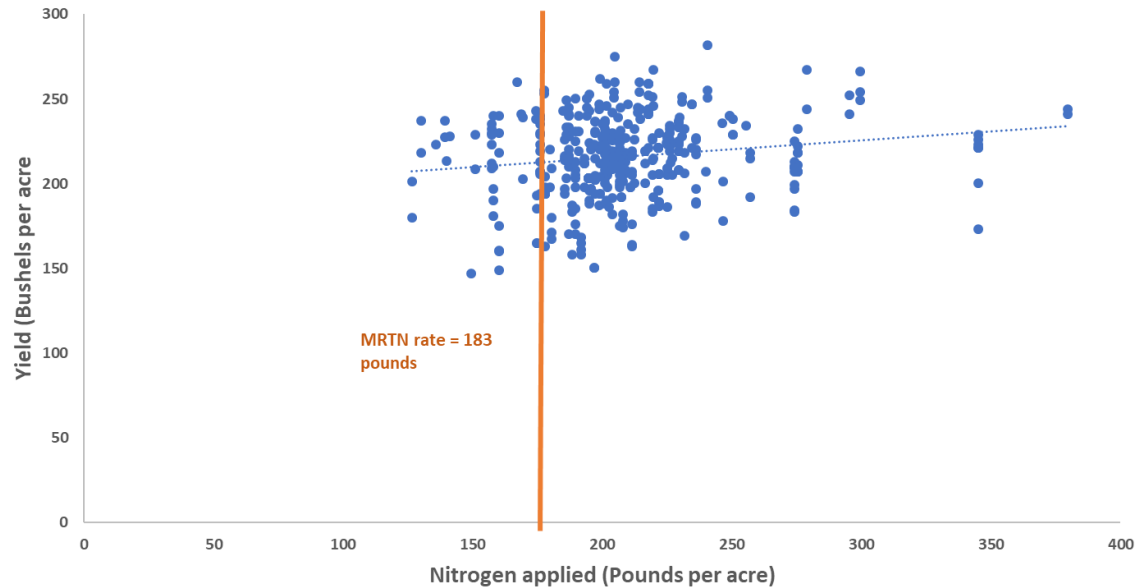
N Application Method	No of Fields *	SPR	Nitrogen Applied (Actual N)				Yields				Opr and Land Return *
			2015	2016	2017	Average *	2015	2016	2017	Average *	
			Pounds per acre				Bushels per acre				\$ per acre
<b>Primarily Fall</b>	<b>287</b>	<b>137</b>	<b>219</b>	<b>220</b>	<b>239</b>	<b>226</b>	<b>186</b>	<b>213</b>	<b>213</b>	<b>204</b>	<b>225</b>
Mostly Pre-Plant	261	131	197	206	205	203	184	219	219	207	253
Mostly Side Dress	207	134	193	198	207	199	191	216	216	208	238
<b>50/50 Preplant</b>	<b>126</b>	<b>134</b>	<b>203</b>	<b>200</b>	<b>207</b>	<b>200</b>	<b>198</b>	<b>226</b>	<b>226</b>	<b>217</b>	<b>271</b>

\* Over three years.

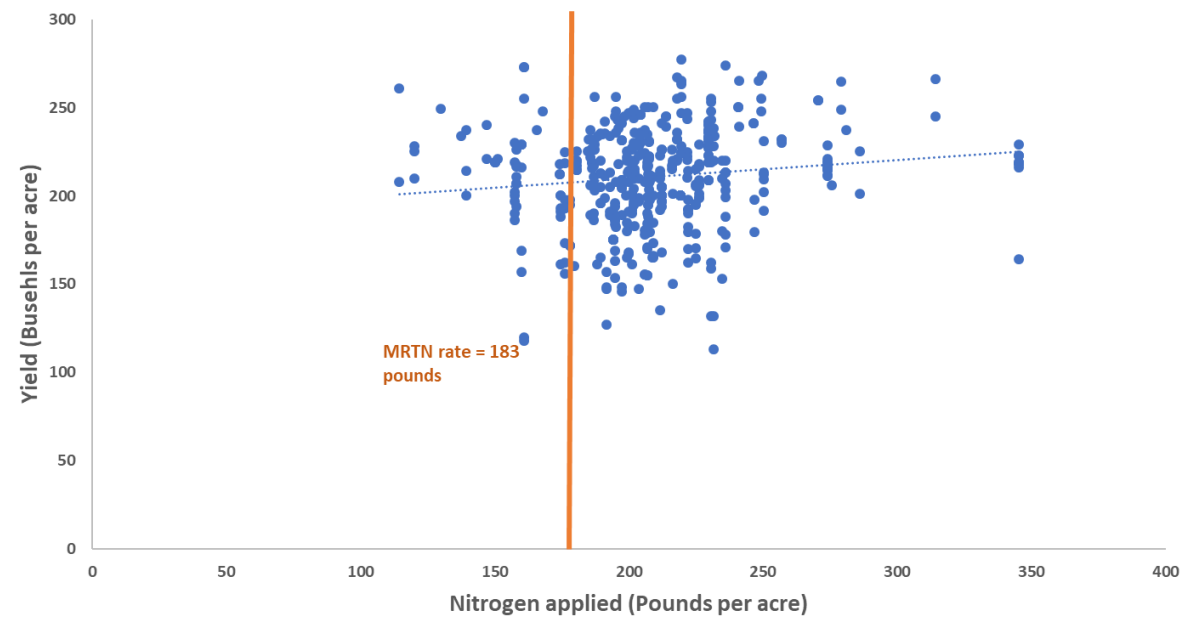
1. Fall application has lowest return
  1. Highest n application (also N serve)
  2. Lowest yield
2. 50/50 pre-plant had highest return

# Yields and Nitrogen Application Amounts, All Corn Fields

Corn Yields and Nitrogen Applied, PCM Farms in 2016

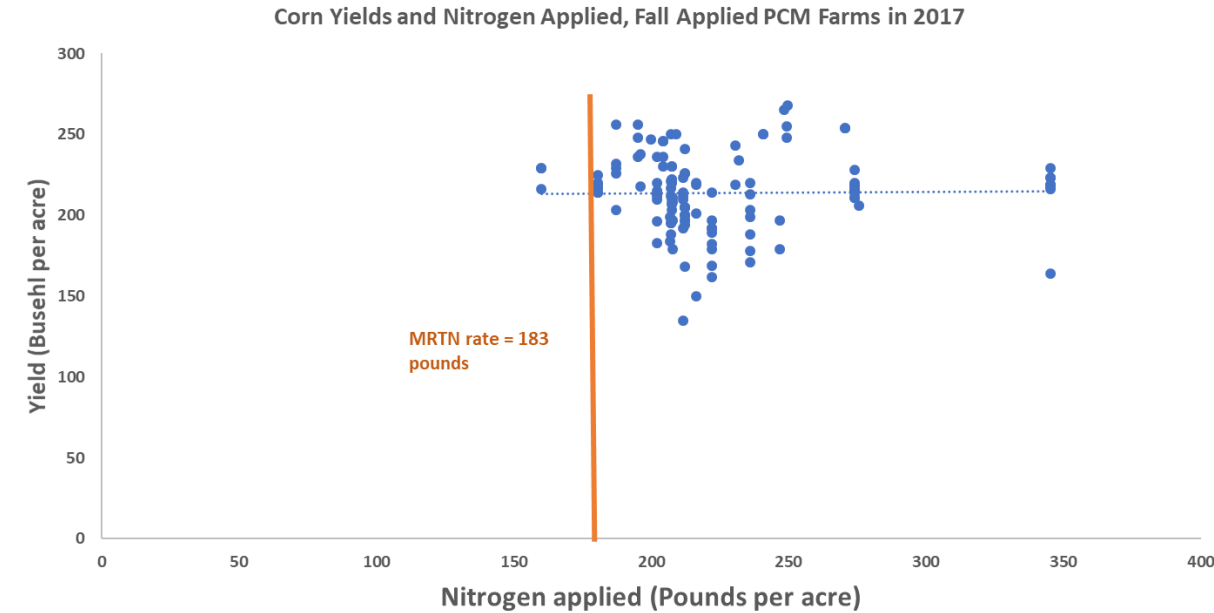
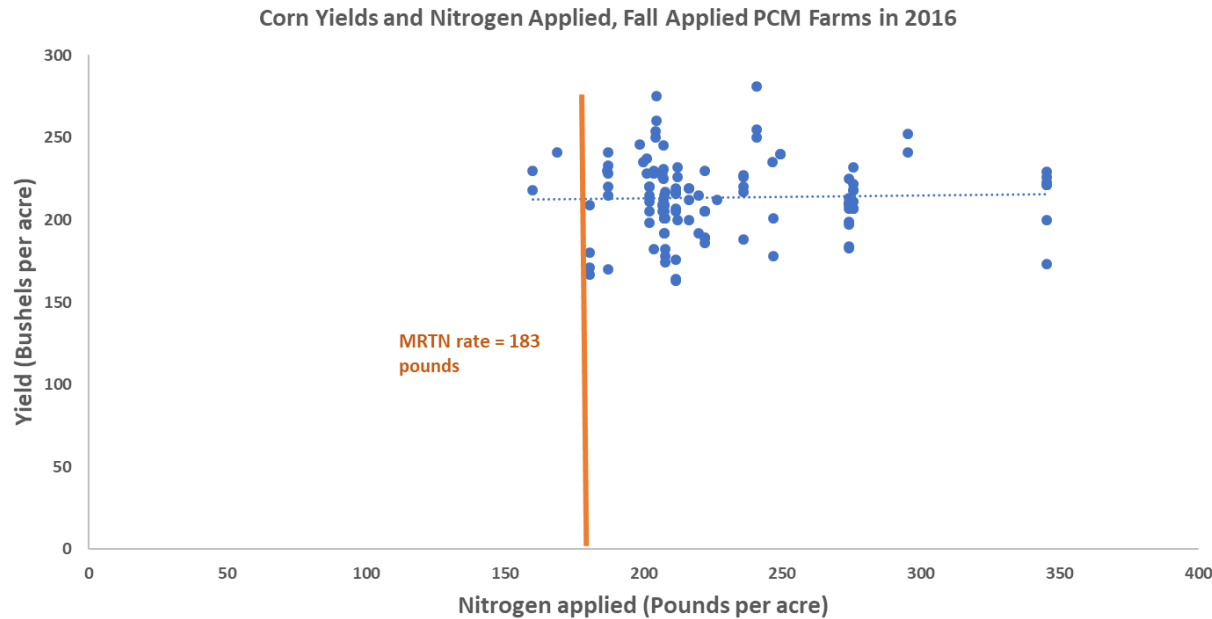


Corn Yields and Nitrogen Applied, PCM Farms in 2017



**From a statistical standpoint, higher N application rates do not lead to higher yields above MRTN**

# Yields and Nitrogen Application Amounts, Fall Applied Fields



**From a statistical standpoint, higher N application rates do not lead to higher yields above MRTN**



# Nitrogen Rates, Yields, and Returns

N amount (lbs per acre)	No of Fields *	SPR	Yield				Opr and Land Return *
			2015	2016	2017	Average *	
			Bushels per acre				
Less than 150	30	133	142	213	218	191	241
151 to 175	61	135	196	209	212	206	277
176 to 200	224	132	182	211	214	202	248
201 to 225	375	135	196	216	214	208	253
Over 225	244	134	187	209	218	204	223

\* Over three years (weighted by fields)

Note that highest income category was 151 to 175

# Cover Crops

## Cover crops with next crop soybeans

Method	No of Fields *	SPR *	Yield *	Opr and Land Return *
None	893	134	65	394
Over winter	51	132	67	410
Terminal	8	135	69	448

\* Over three years.

## Observations

- **Not many fields with cover crops**
- **Yields were not lower and profit was not lower**
- **Reduced tillage may have had something to do with higher returns**

# Cover Crops

- **farmdocDaily,  
August 14, 2018**
- **Cover crops do  
reduce nitrogen in  
tile drained soils**
- **Good reasons to  
believe long-term  
benefits with  
continual cover crop  
use (little data)**

## **Economic suggestions**

- **Suggest picking owned fields (or share rented)**
- **Suggest continual use of cover crops on the same field**
- **Suggest coming up with a way of evaluating progress of cover crops**
- **Works best in no-till situations. Herbicides used to kill cover crop**
- **There is a need to keep seed costs low (low seeding rates and prices)**
- **Minimize additional herbicide applications**

# Summary

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- **Suggests attempting 1 pass or less on soybeans**
- **Suggest strip or 1 pass systems on corn**
- **Experimenting with N near MRTN seems prudent**
- **Splitting nitrogen and moving some to post plant**
- **Cover crops on owned farmland, while keeping establishment costs low**