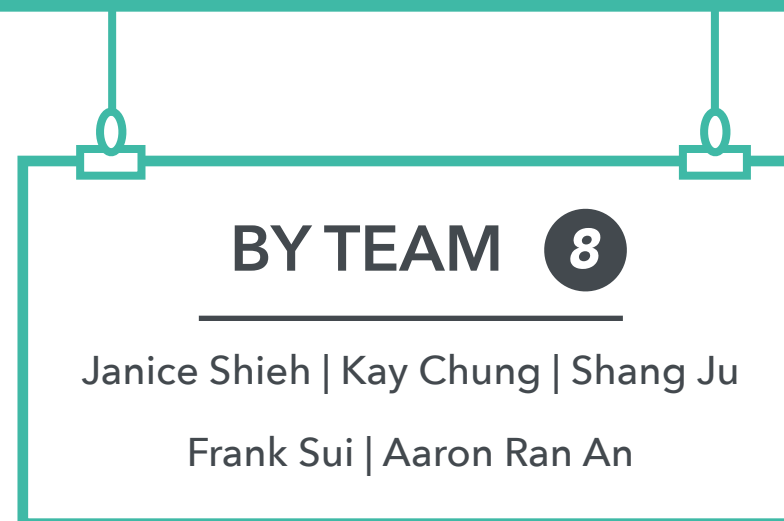


# FARM JOURNAL **DATA MINING** PROJECT

# IN PURSUIT OF **THE LIFT**



**PROJECT OBJECTIVE**

**CUSTOMER OVERVIEW & PRIORITIZATION**

**DEFINING IMMEDIATE OPPORTUNITIES**

**MODELING & IMPLICATIONS**

# AGENDA |

**PROJECT OBJECTIVE**

**CUSTOMER OVERVIEW & PRIORITIZATION**

**DEFINING**

**MODELING &**



# PROJECT OBJECTIVES

What are we trying to achieve?

**Find cross-selling opportunities by prioritizing products within the brand portfolio**

**Build future cross-selling opportunities by acquiring customers through key entry products**

# AGENDA |

PROJECT OBJECTIVE

**CUSTOMER OVERVIEW & PRIORITIZATION**

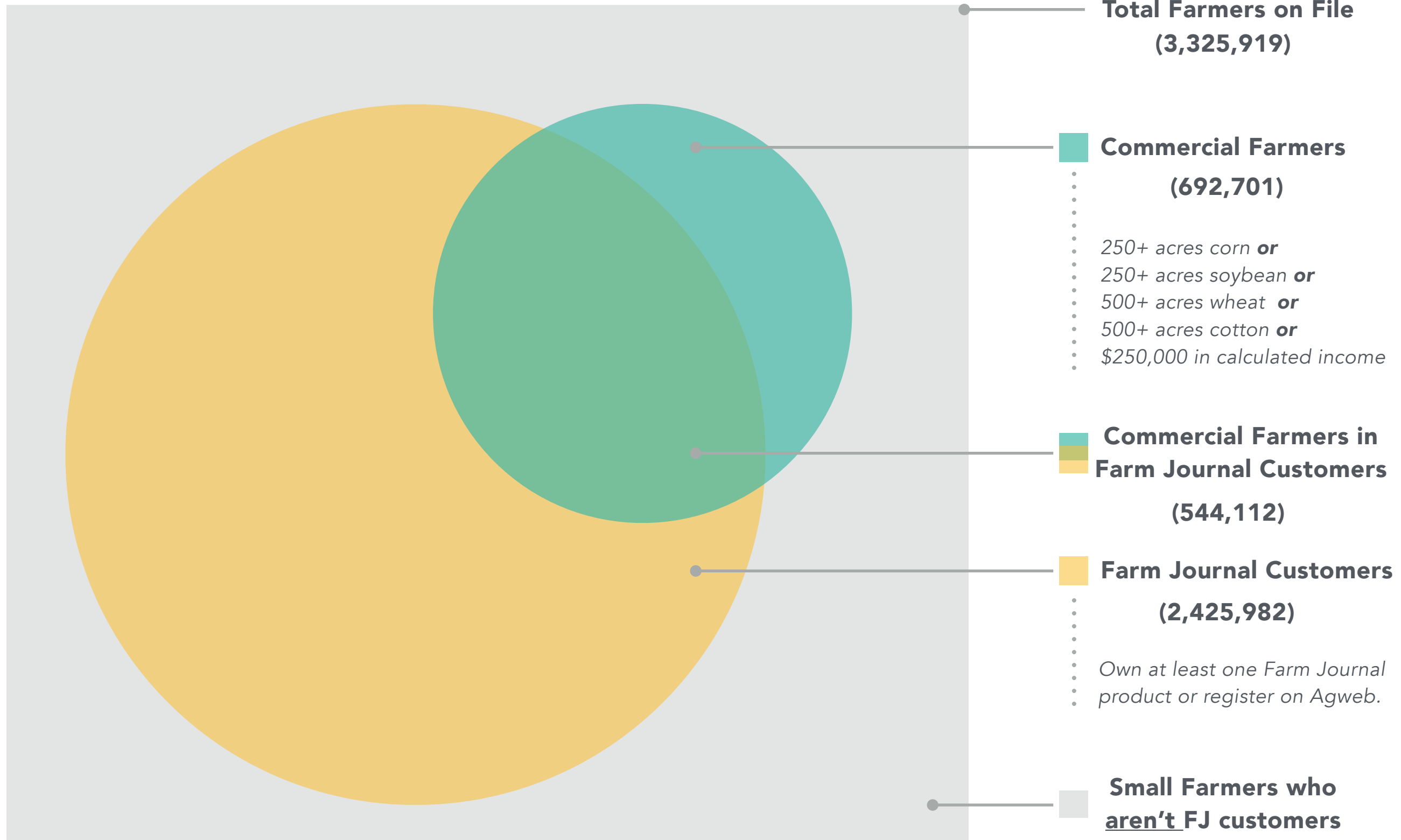
DEFINING

MODELING &

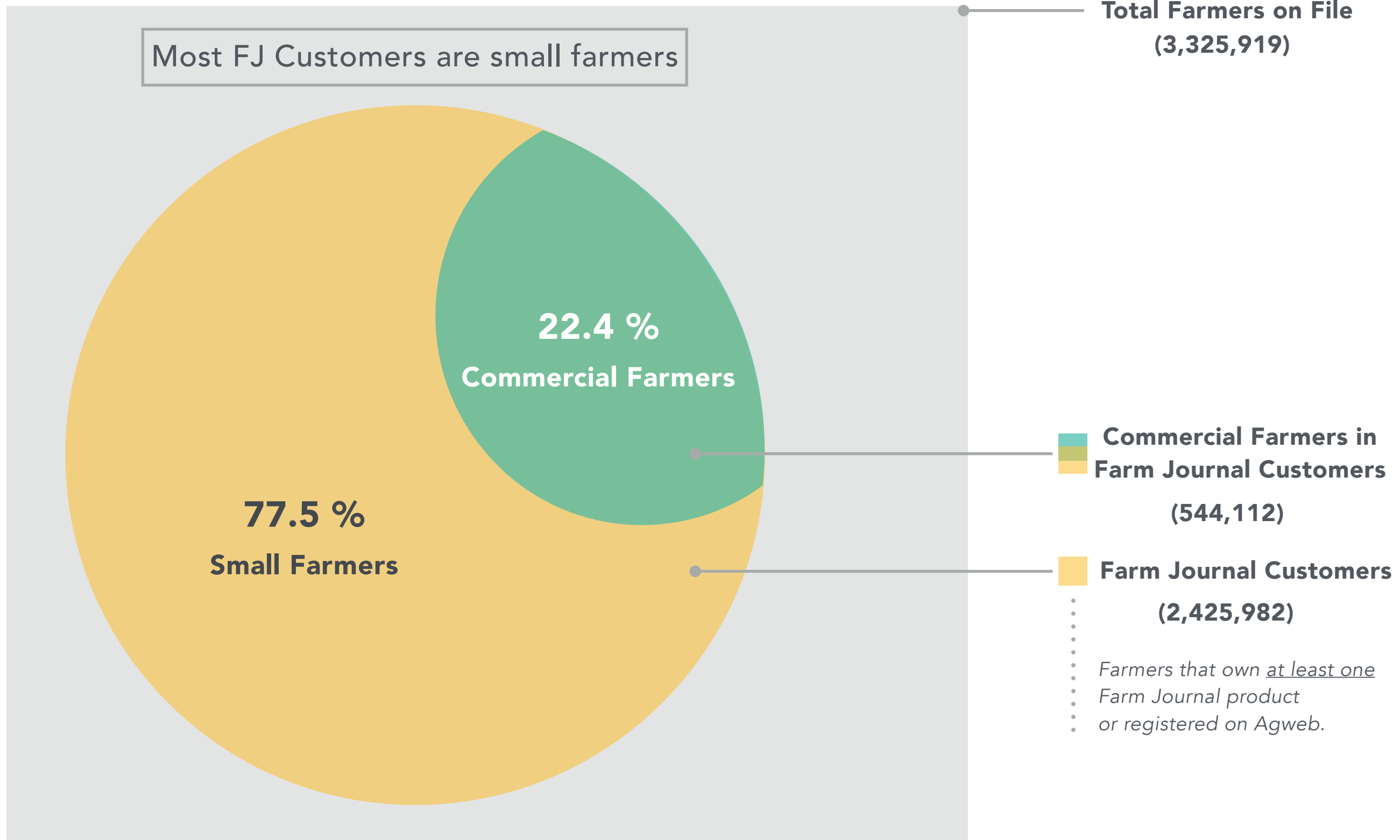


# DECOMPOSITION OF CUSTOMER BASE

Who composed **Total Contacts/Farmers on file**?

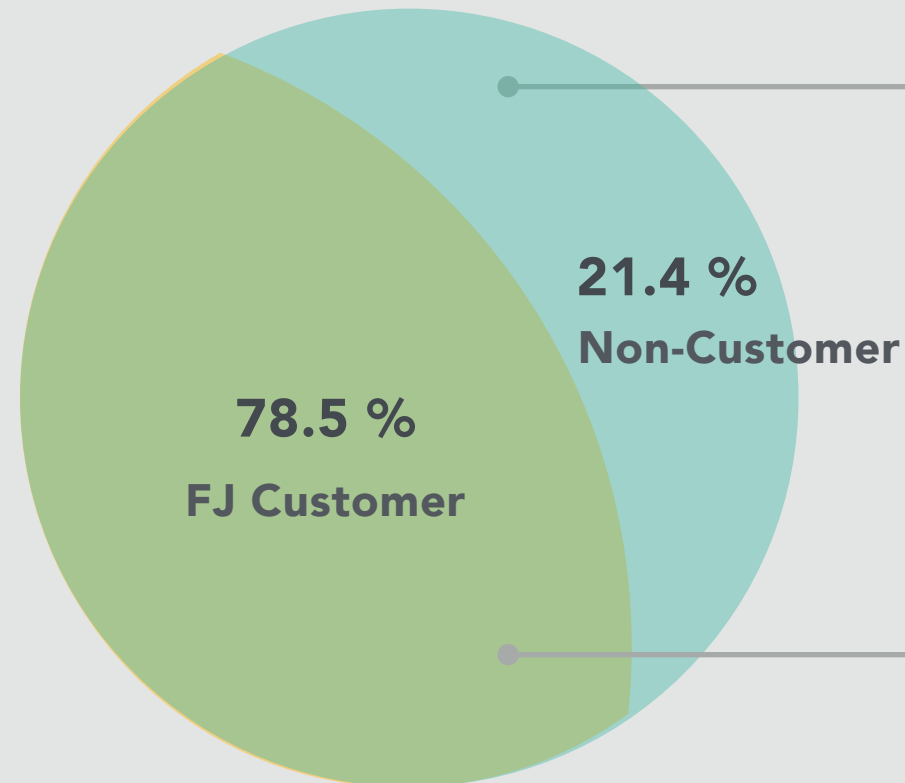


## Who composed **Farm Journal Customers**?



# DECOMPOSITION OF CUSTOMER BASE

Who composed **Commercial Farmers**?



**Total Farmers on File**  
**(3,325,919)**

**Commercial Farmers**  
**(692,701)**

250+ acres corn **or**  
250+ acres soybean **or**  
500+ acres wheat **or**  
500+ acres cotton **or**  
\$250,000 in calculated income

**Commercial Farmers in**  
**Farm Journal Customers**  
**(544,112)**

Most Commercial Farmers are FJ Customers

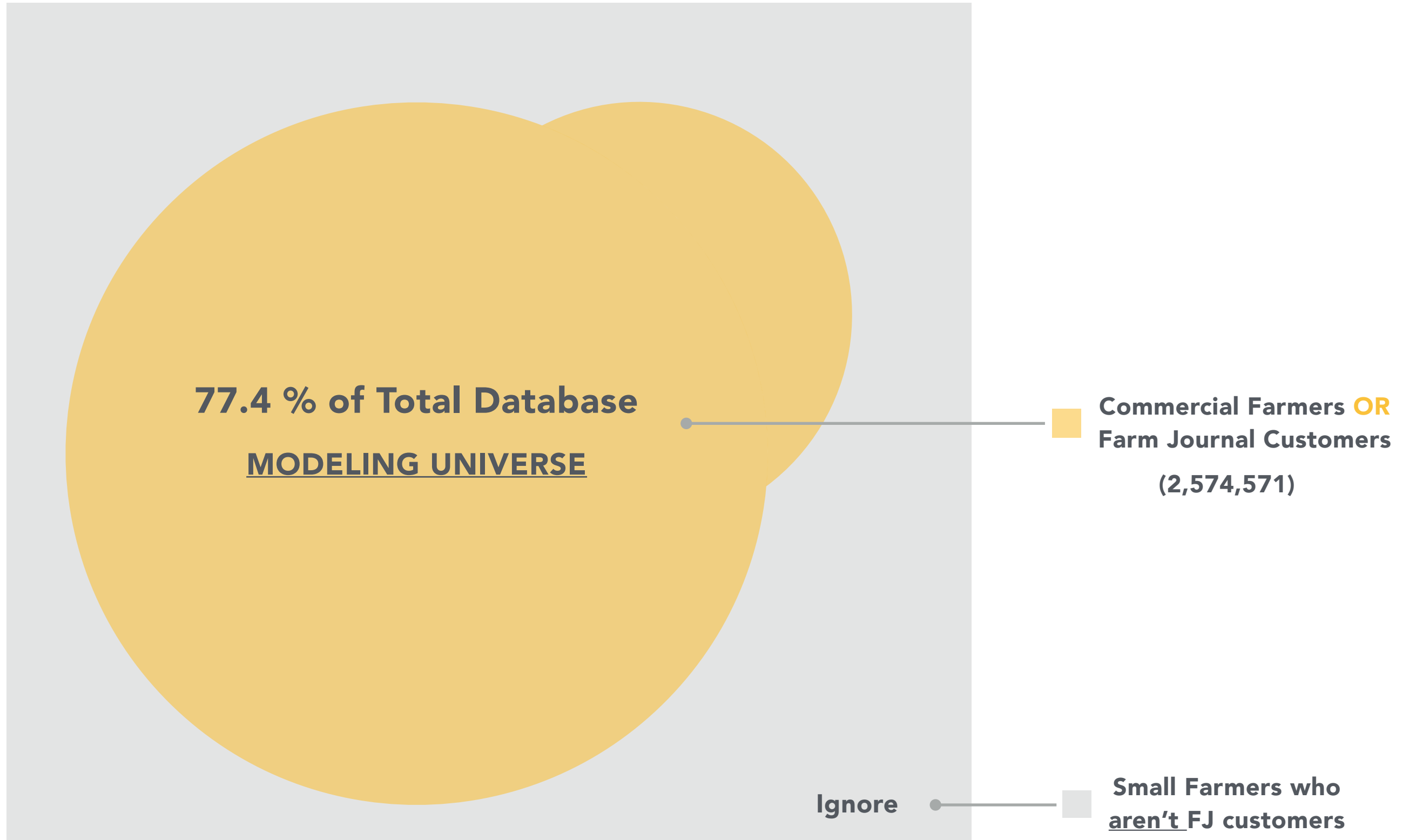
**Commercial Farmers are**

- Business-oriented
- Invest more but scrutinize
- Technology-oriented
- More likely to try new products



# DECOMPOSITION OF CUSTOMER BASE

Who composed total contacts/farmers on file?



# AGENDA |

PROJECT OBJECTIVE

CUSTOMER OVERVIEW & PRIORITIZATION

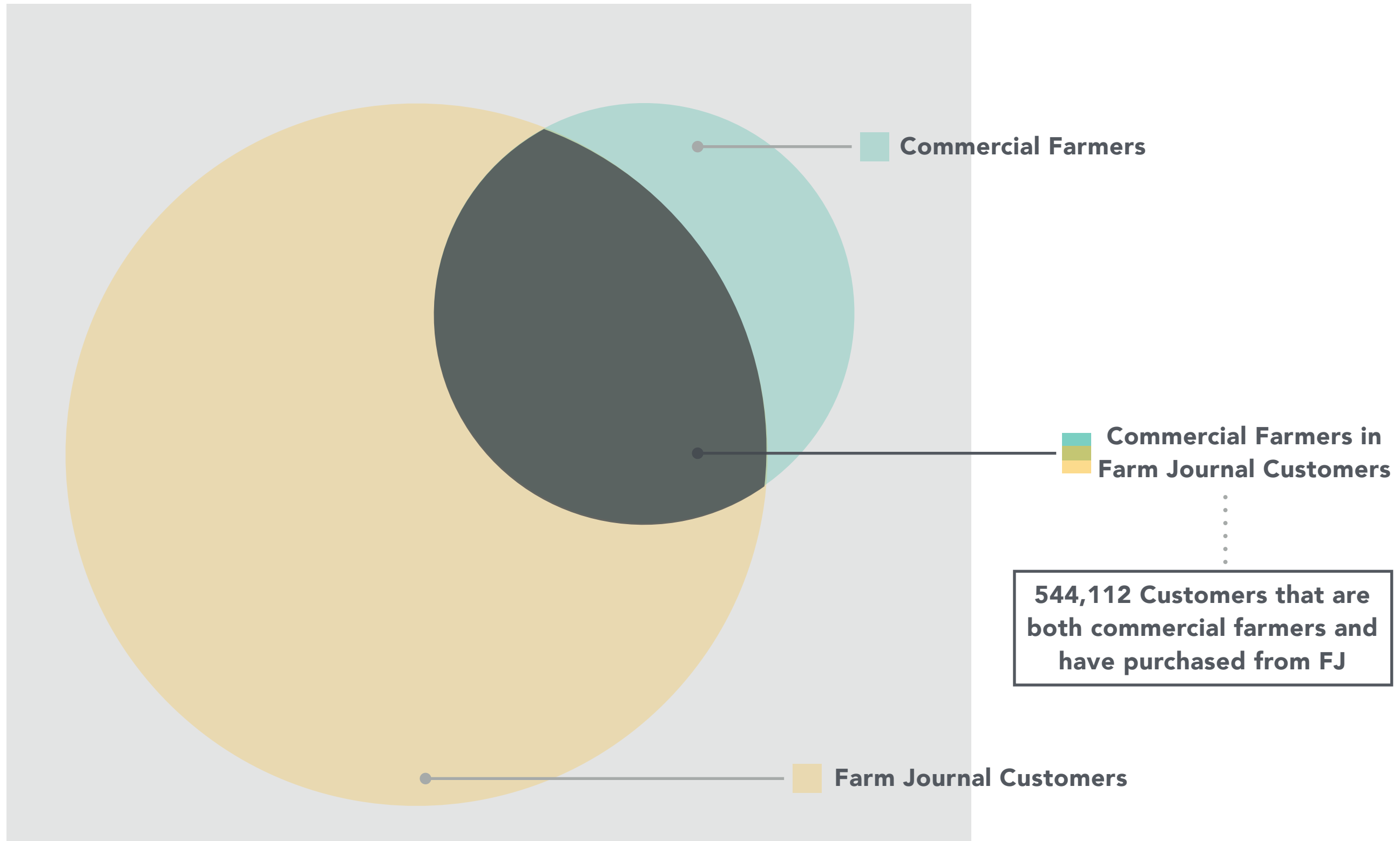
**DEFINING IMMEDIATE OPPORTUNITIES**

MODELING &



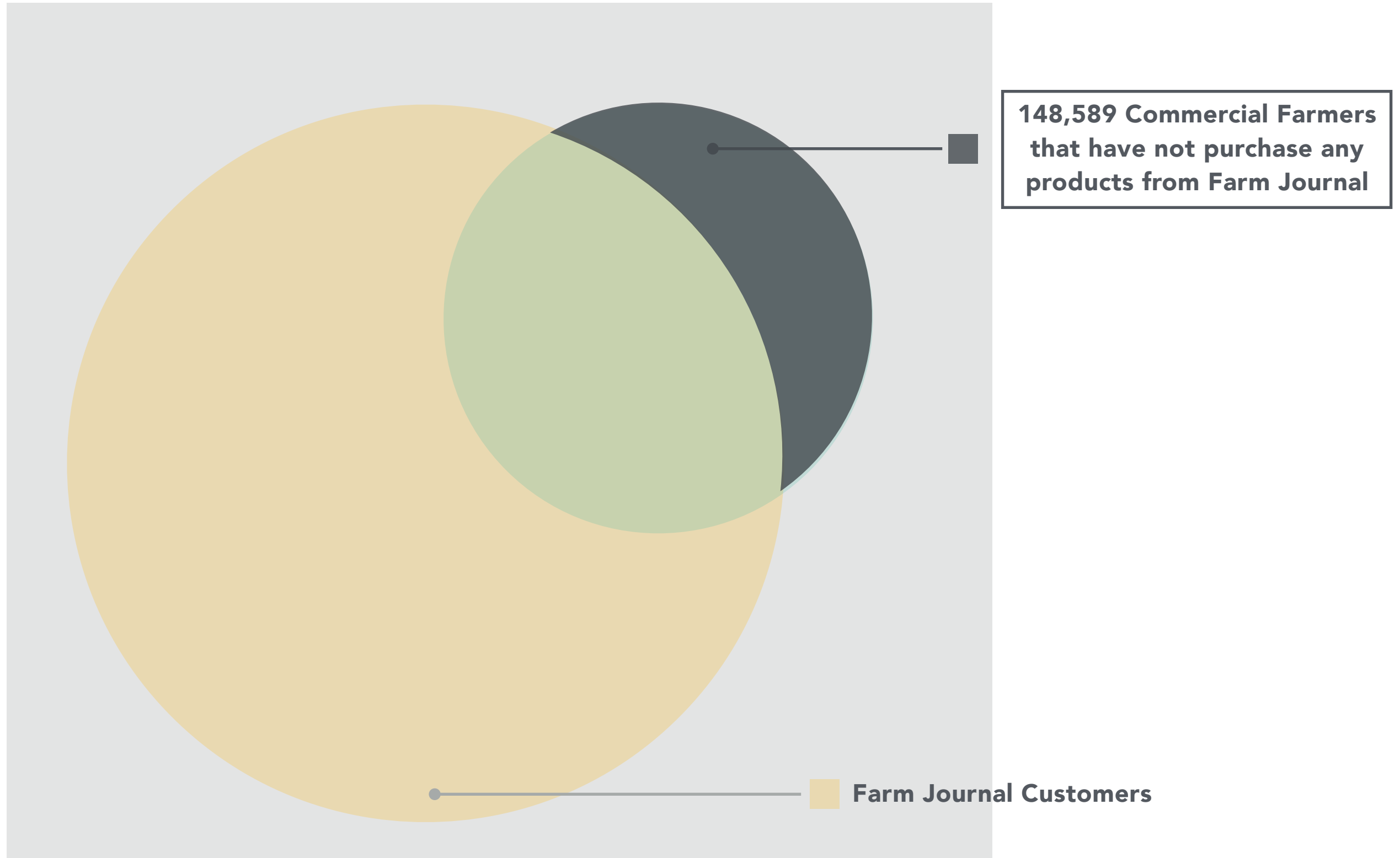
# DEFINING IMMEDIATE OPPORTUNITIES

Understanding the potential cross-sell groups



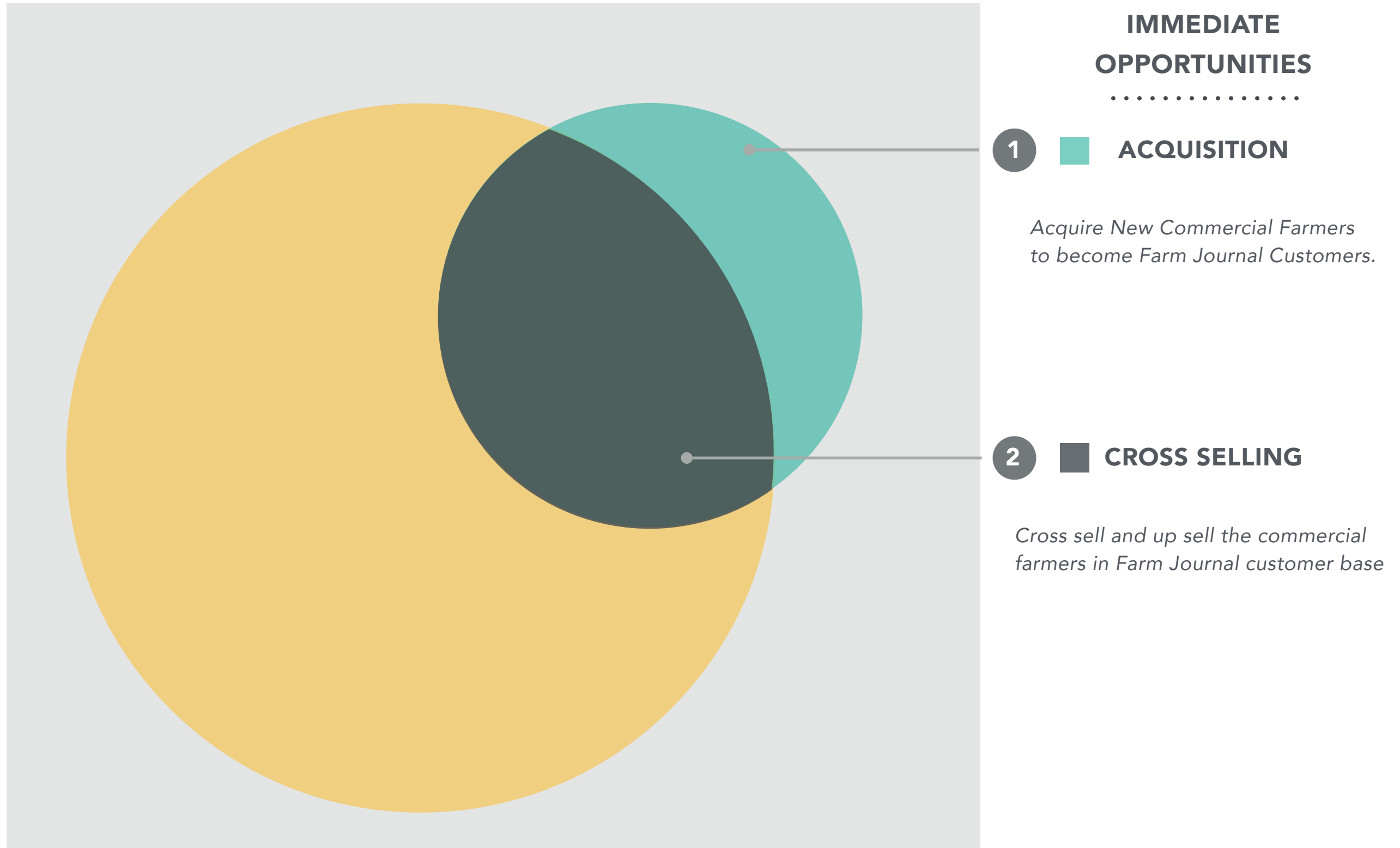
# DEFINING IMMEDIATE OPPORTUNITIES

Understanding the potential cross-sell groups



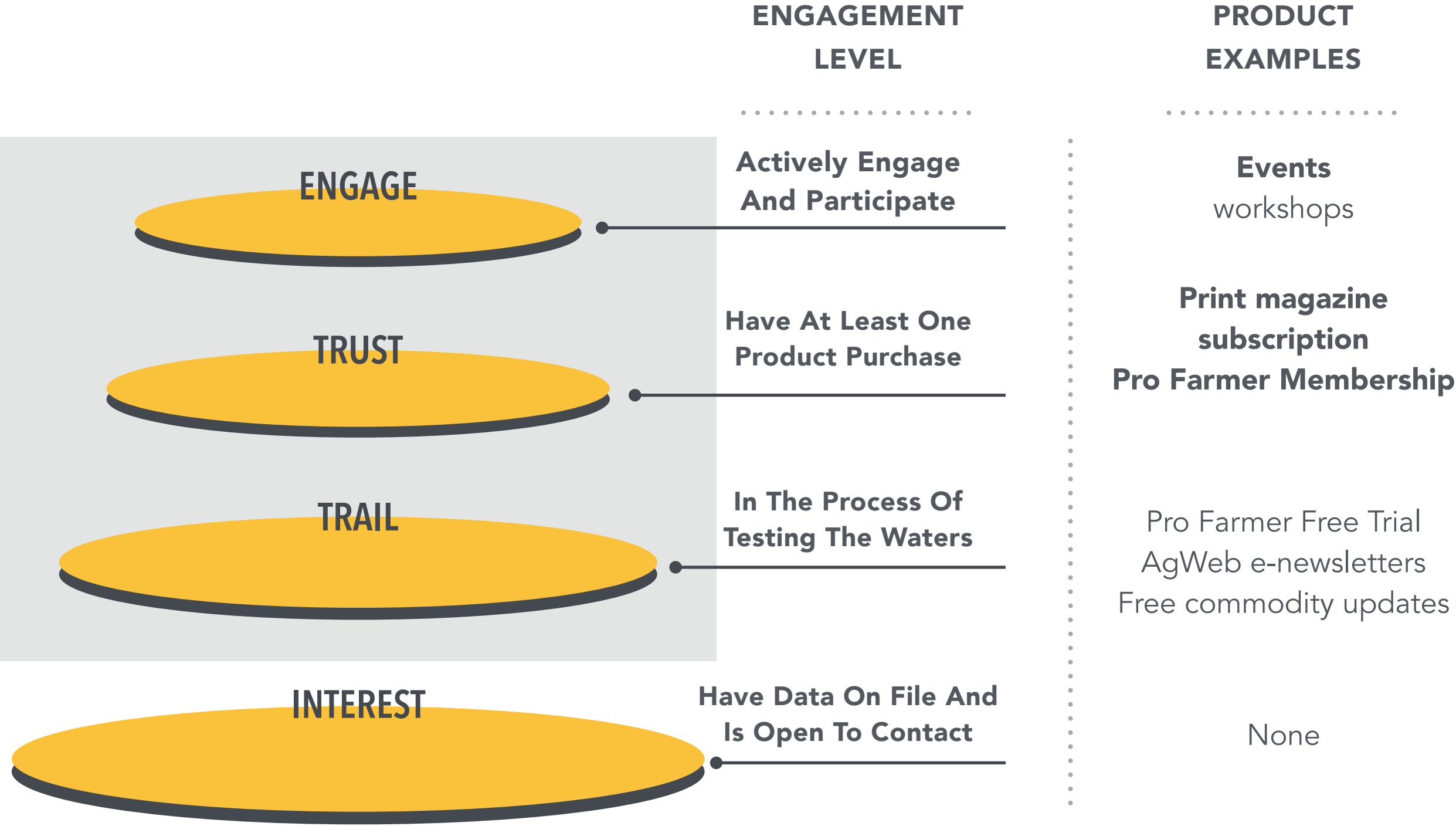
# DEFINING IMMEDIATE OPPORTUNITIES

What's our immediate cross selling and acquisition opportunities?



# PRIORITIZATION OPPORTUNITIES

How do we prioritize different contacts and offers



# DEFINING IMMEDIATE OPPORTUNITIES

Acquire Non Customers in Commercial Farmers to become FJ Customers

138,589 Commercial Farmers who haven't purchased anything from Farm Journal

21.4 % of  
Commercial  
Farmer

1



## ACQUISITION

*Acquire New Commercial Farmers to become Farm Journal Customers.*

### AMONG ALL THE COMMERCIAL FARMERS ON FILE

#### EVENT

98.8% Have attended x 0  
1.2% Have attended x 1  
None Have attended x 2

#### SUBSCRIPTION

59.95% Have purchased x 0

#### PRO FARMER

94.43% Have purchased x 0

# DEFINING IMMEDIATE OPPORTUNITIES

Cross sell Event and Subscription within current Commercial Farmer Customers

2

## CROSS SELLING

*Cross sell and up sell the commercial farmers in Farm Journal customer base*

**78.5 % of  
Commercial  
Farmer**

### AMONG ALL THE COMMERCIAL FARMERS ON FILE

#### EVENT

98.8% Have attended x 0

1.2% Have attended x 1

#### SUBSCRIPTION

59.95% Have purchased x 0

10.94% Have purchased x 1

22.54% Have purchased x 2

6.36% Have purchased x 3

0.22% Have purchased x 4



# AGENDA |

PROJECT OBJECTIVE

CUSTOMER OVERVIEW & PRIORITIZATION

DEFINING

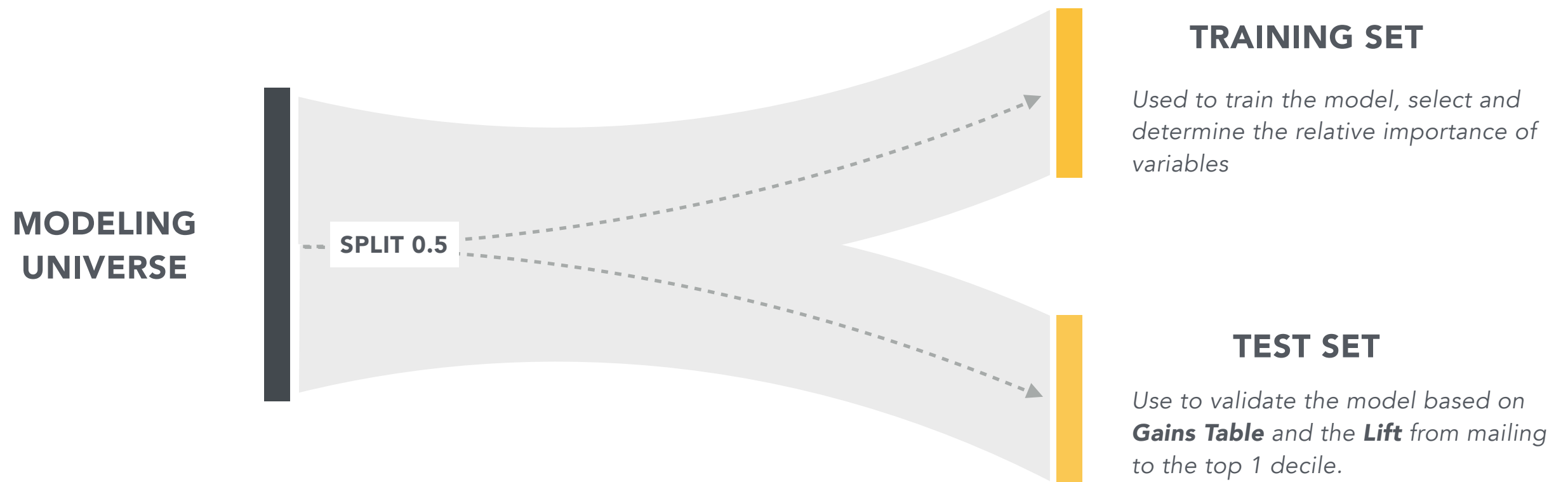
## MODELING & IMPLICATIONS

- *BUSINESS OBJECTIVE*
- *VALIDATING AND SELECTING MODELS*



# MODELING METHOD

How do we validate the model and select the best one?

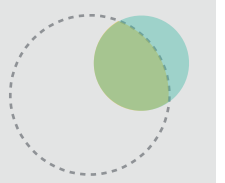


We validate the model base by the lift on **average revenue by decile**, which is the mean column in the Gains Table. By computing the difference between top and bottom decile, we can determine the lift of average customer revenue by mailing to top decile than completely random.

# ACQUISITION MODEL FOR COMMERCIAL FARMERS

How to acquire more commercial farmers

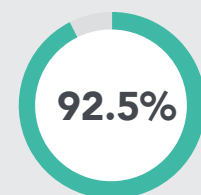
Modeling Universe :  
316,232 Commercial  
Farmers in Training Set



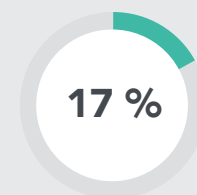
GAINS TABLE

DECILE	N	TOTAL	MEAN	CUMN	CUMSUM	CUMMEAN
1	31,623	31,622	1.000	31,623	31,622	1.000
2	31,623	31,620	1.000	63,246	63,242	1.000
3	31,623	31,602	0.999	94,869	94,844	1.000
4	31,624	31,526	0.997	126,493	126,370	0.999
5	31,623	31,473	0.995	158,116	157,843	0.998
6	31,623	30,736	0.972	189,739	188,579	0.994
7	31,624	28,800	0.911	221,363	217,379	0.982
8	31,623	21,998	0.696	252,986	239,377	0.946
9	31,624	7,382	0.233	284,610	246,759	0.867
10	31,622	3,298	0.104	316,232	250,057	0.7

## MODELING RESULTS



Test Set  
Classification  
Rate



False  
Positive  
Rate

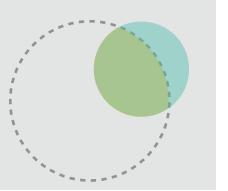


89.6 % Propensity Lift

# ACQUISITION MODEL FOR COMMERCIAL FARMERS

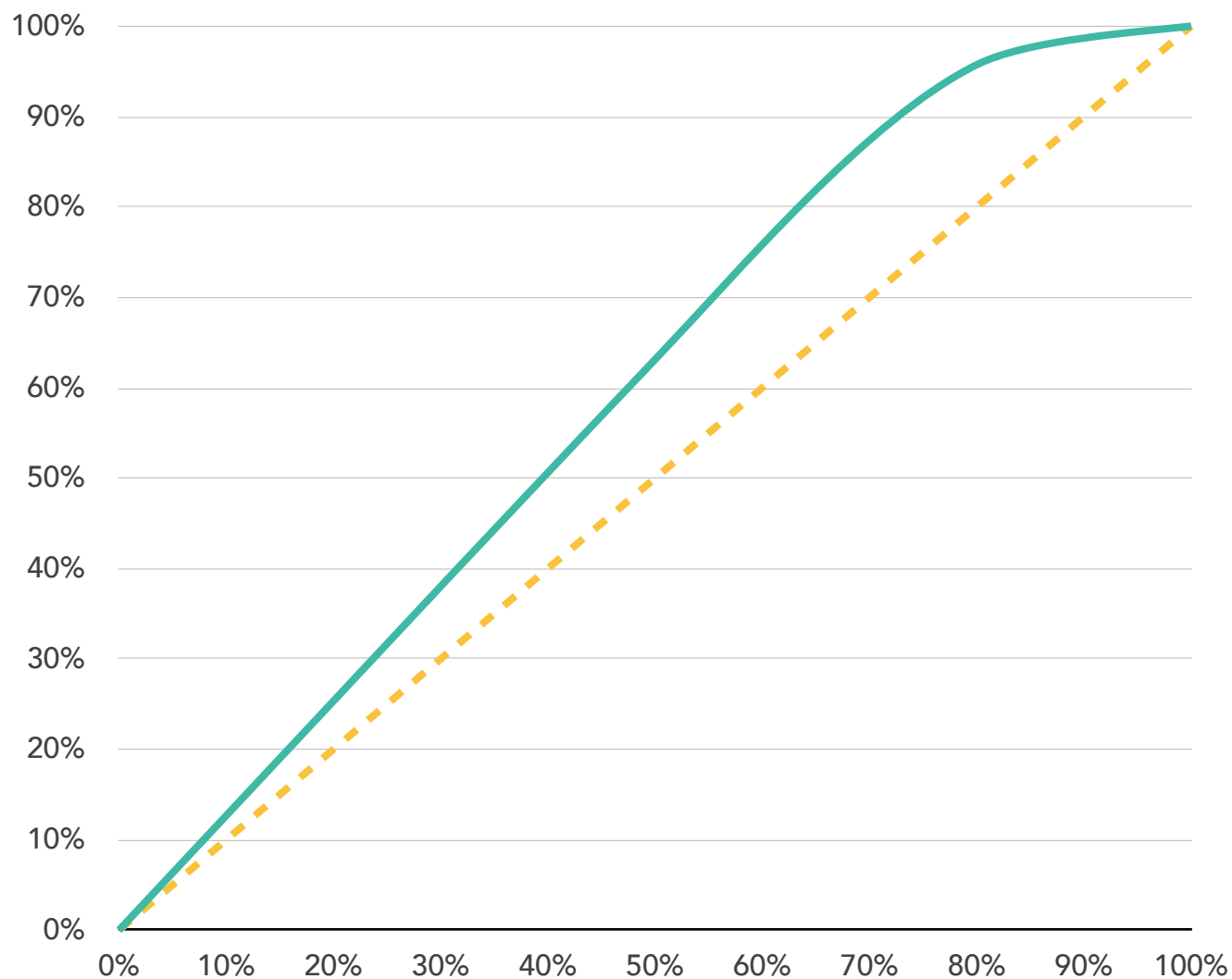
## Modeling Results and Lift

**Modeling Universe :**  
316,232 Commercial  
Farmers in Training Set



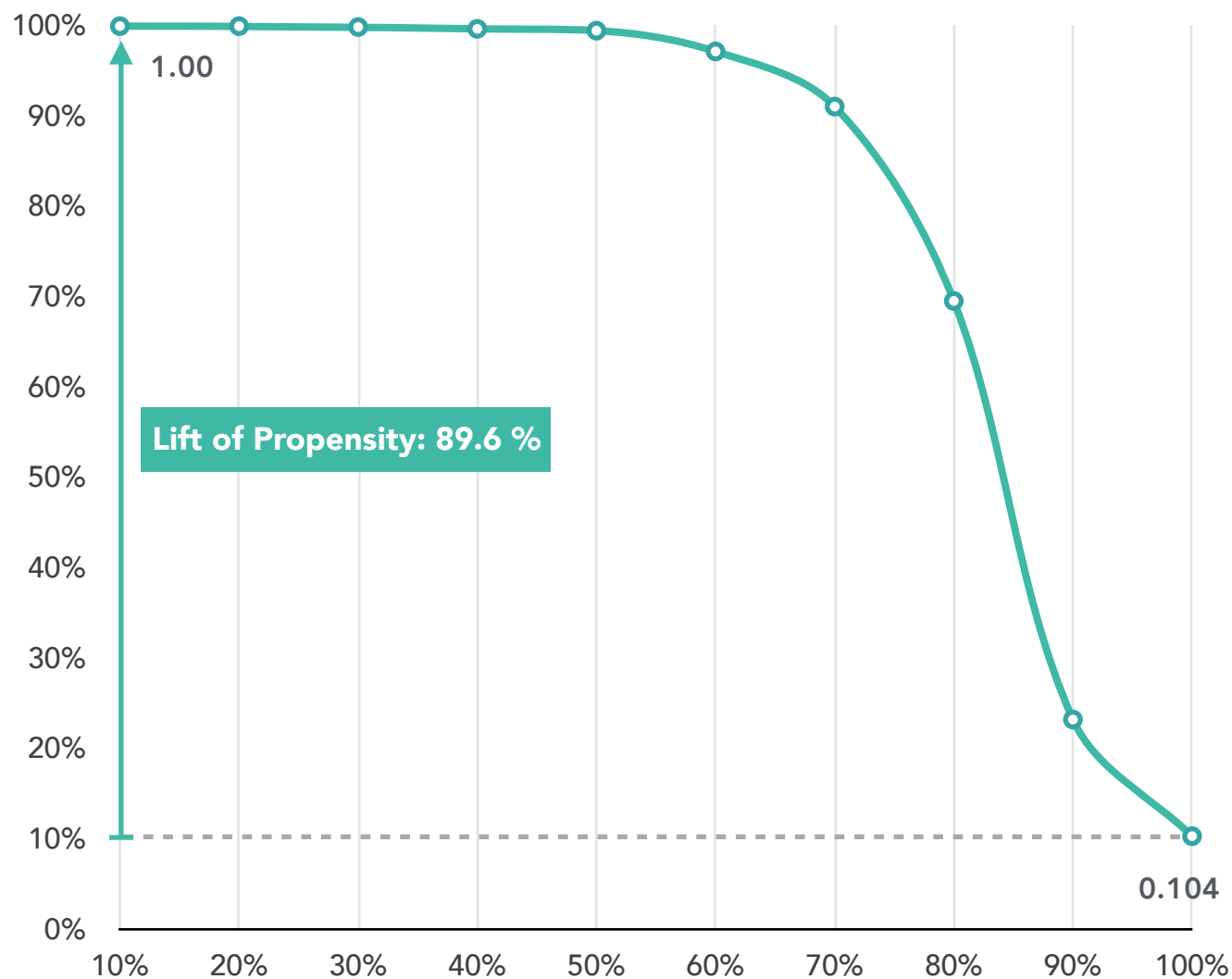
### Gains Charts Of Responders And Decile Propensity

Percent of Responders



Mailing Depth by Deciles

Average Propensity by Decile

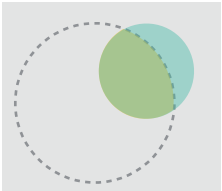


Mailing Depth by Deciles

# ACQUISITION MODEL FOR COMMERCIAL FARMERS

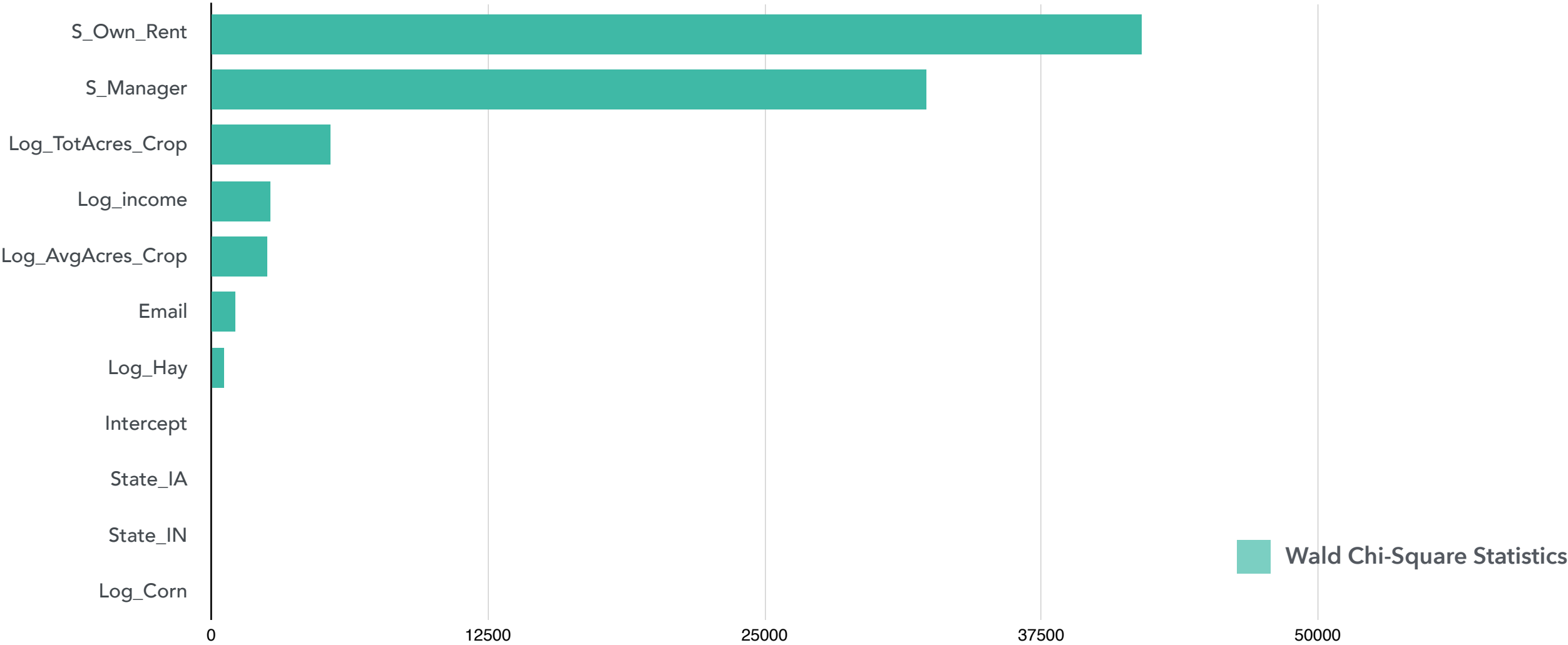
What Variables Matter?

Modeling Universe :  
316,232 Commercial  
Farmers in Training Set



*Managers that own a large farm acres and rent it out are more likely to be interested in getting extra information on how to run their farms better.*

.....

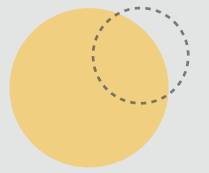


Bar size represents the relative importance of predictor variables

# CROSS SELL MODEL FOR EVENTS RESPONSE

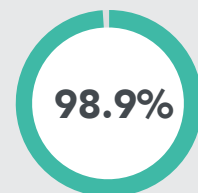
How to make more people go to events

Modeling Universe :  
335,509 Farm Journal  
Customers in Training Set

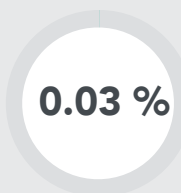


DECILE	N	TOTAL	MEAN	CUMN	CUMSUM	CUMMEAN
1	33,550	2,999	<b>0.089</b>	33,550	2,999	0.089
2	33,551	336	0.010	67,101	3,335	0.050
3	33,551	124	0.004	100,652	3,459	0.034
4	33,551	58	0.002	134,203	3,517	0.026
5	33,551	19	0.001	167,754	3,536	0.021
6	33,551	12	0.000	201,305	3,548	0.018
7	33,551	6	0.000	234,856	3,554	0.015
8	33,551	1	0.000	268,407	3,555	0.013
9	33,551	3	0.000	301,958	3,558	0.012
10	33,551	0	<b>0.000</b>	335,509	3,558	0.011

## MODELING RESULTS



Test Set  
Classification  
Rate



False  
Positive  
Rate

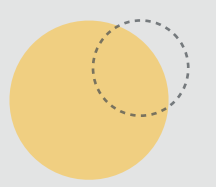


Propensity Lift  
8.9% Mail Top 10%  
14.8% Mail Top 5%

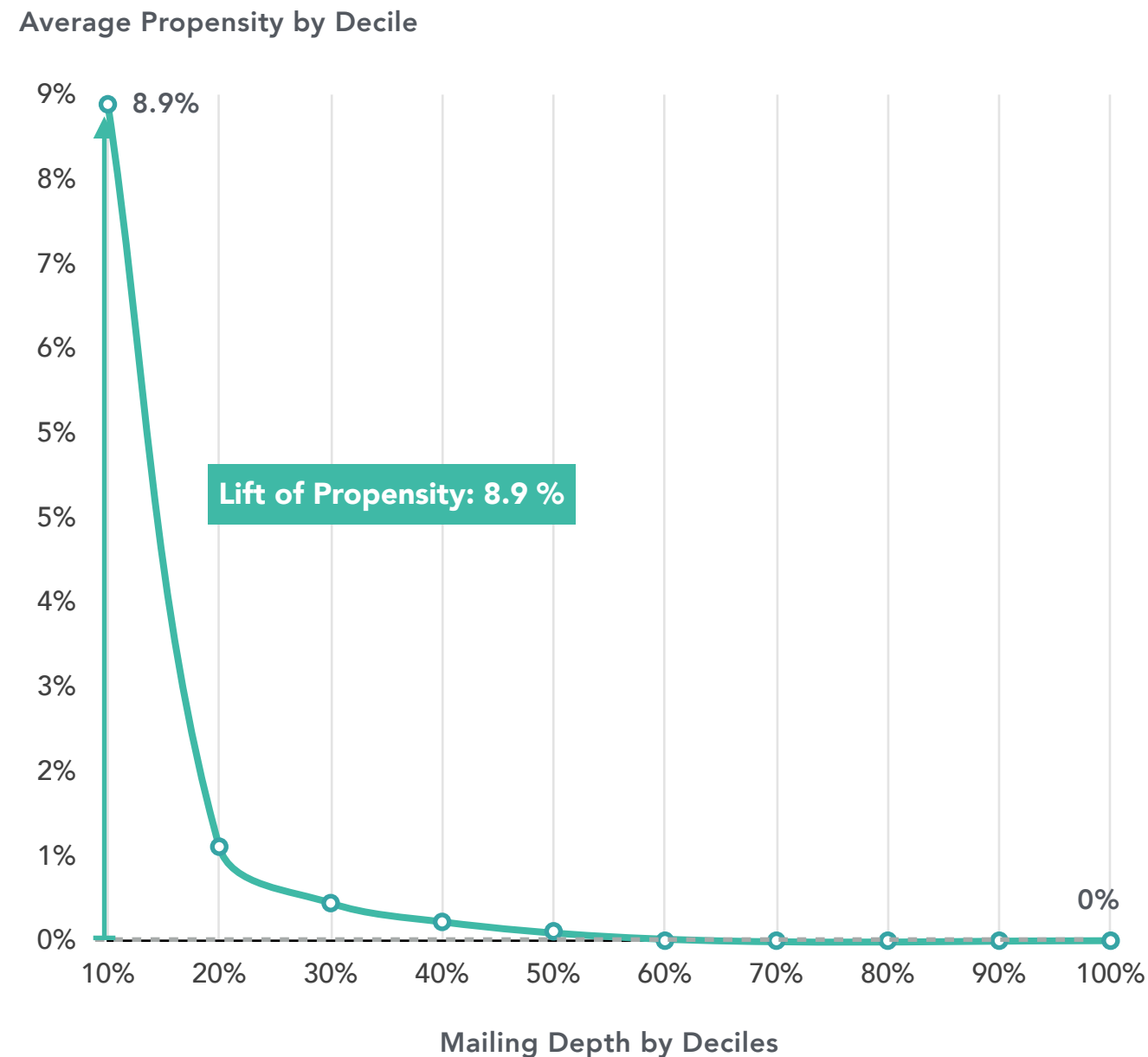
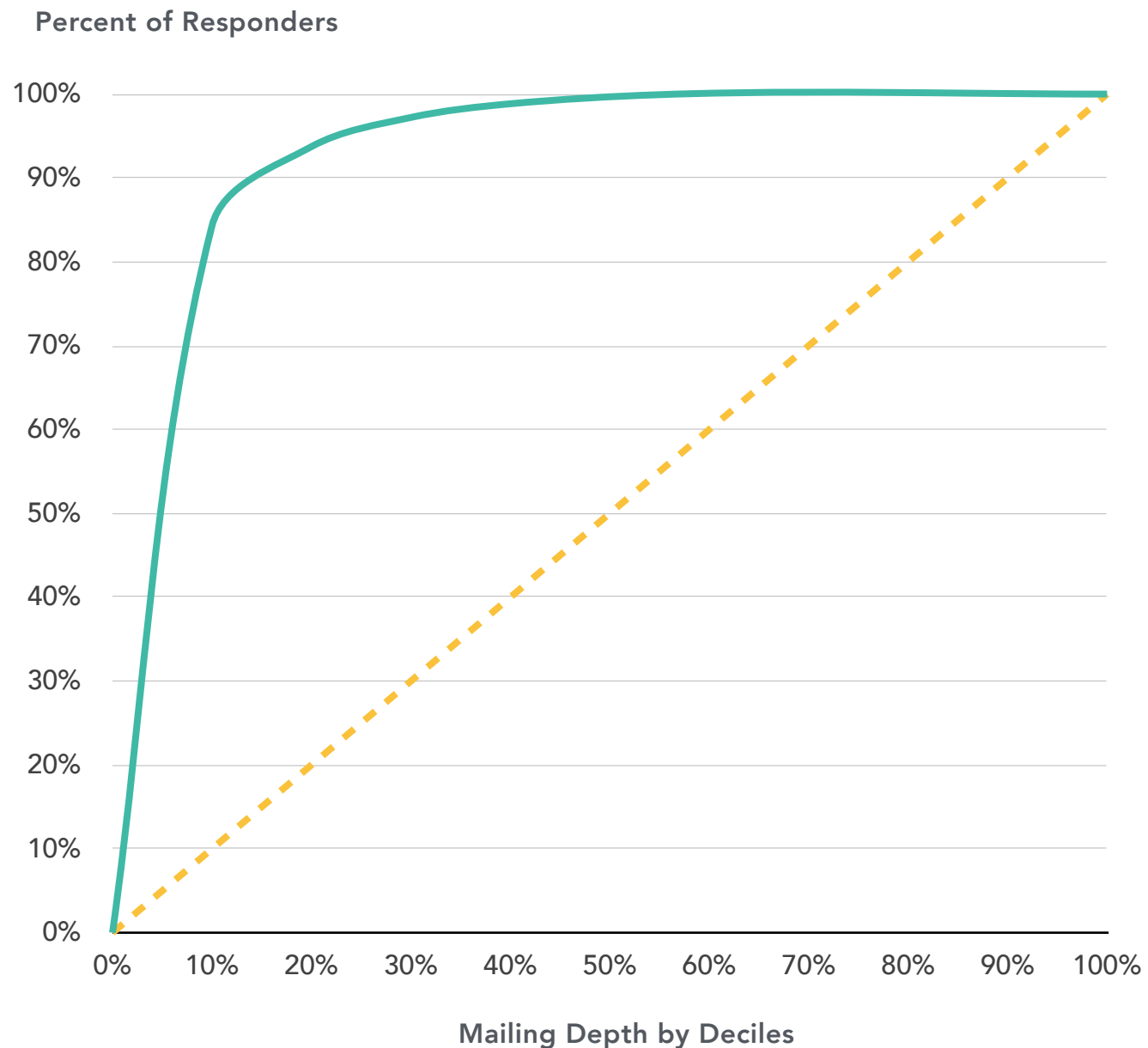
# CROSS SELL MODEL FOR EVENTS RESPONSE

## Modeling Results and Lift

**Modeling Universe :**  
335,509 Farm Journal  
Customers in Training Set

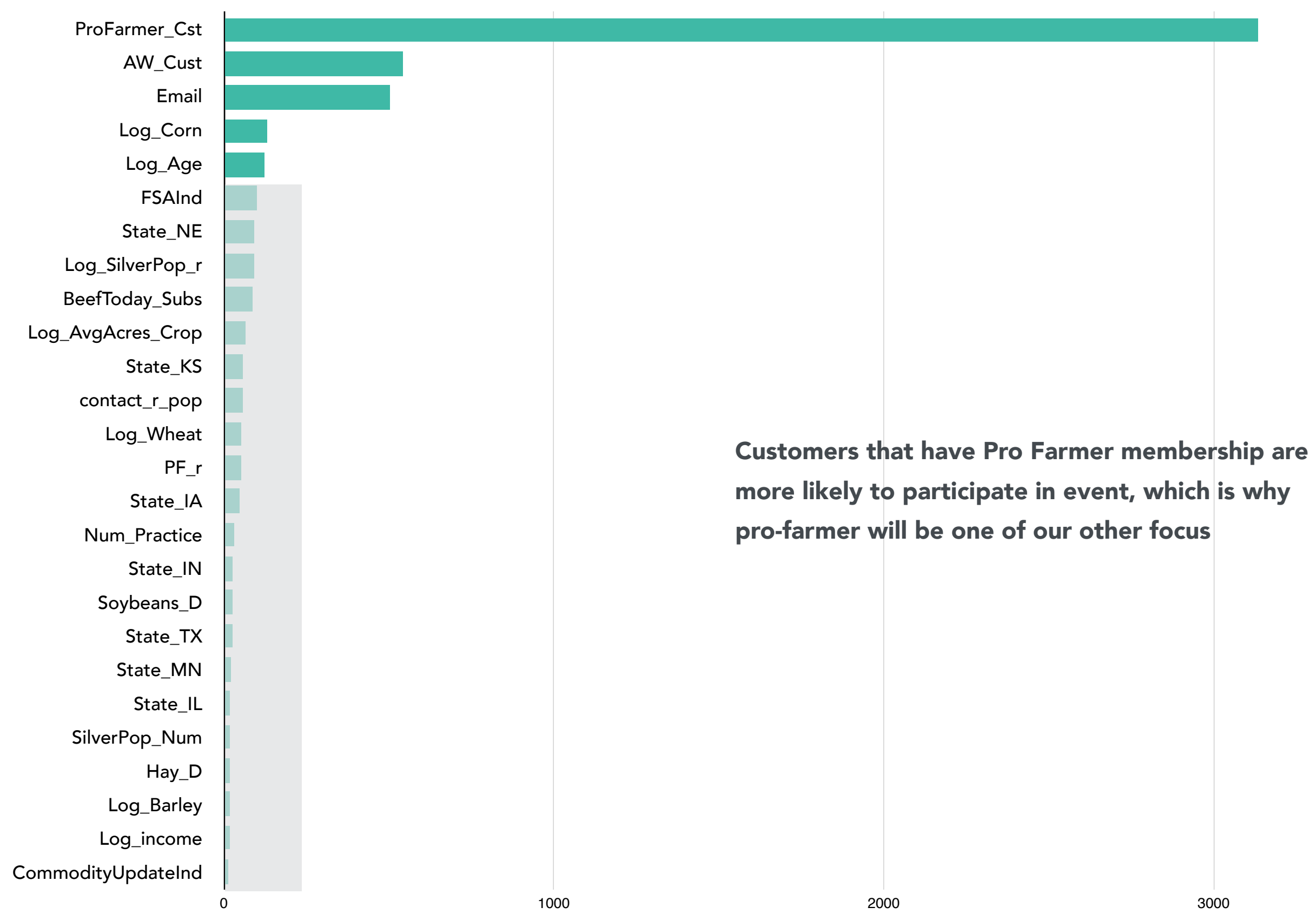


### Gains Charts Of Responders And Decile Propensity



# CROSS SELL MODEL FOR EVENTS RESPONSE

## What Characteristics Matter?





# MODELING SUBSCRIPTION RESPONSE

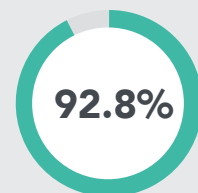
How to make more people order **print magazines**

Modeling Universe :  
493,127 Farm Journal  
Customers in Training Set

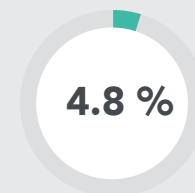


DECILE	N	TOTAL	MEAN	CUMN	CUMSUM	CUMMEAN
1	49,312	47,415	0.962	49,312	47,415	0.962
2	49,313	46,313	0.939	98,625	93,728	0.950
3	49,313	42,780	0.868	147,938	136,508	0.923
4	49,312	25,189	0.511	197,250	161,697	0.820
5	49,313	4,315	0.088	246,563	166,012	0.673
6	49,313	764	0.015	295,876	166,776	0.564
7	49,323	192	0.004	345,199	166,968	0.484
8	49,303	91	0.002	394,502	167,059	0.423
9	49,313	67	0.001	443,815	167,126	0.377
10	49,312	204	0.004	493,127	167,330	0.339

## MODELING RESULTS



Test Set  
Classification  
Rate



False  
Positive  
Rate



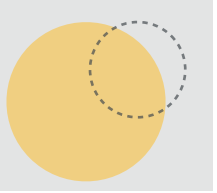
## Propensity Lift

95.8% Mail Top 10%  
96.1% Mail Top 5%

# MODELING SUBSCRIPTION RESPONSE

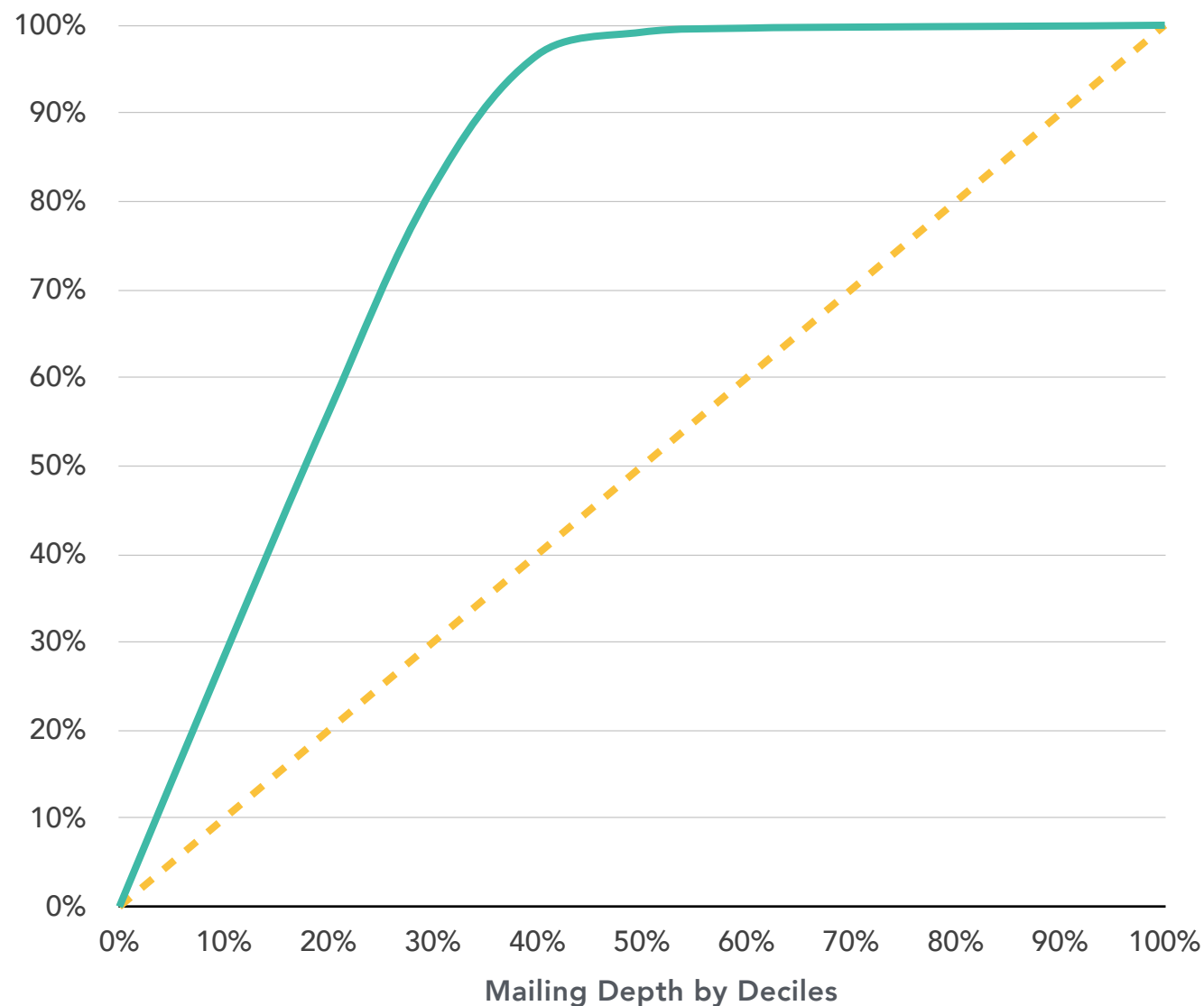
## Modeling Results and Lift

**Modeling Universe :**  
493,127 Farm Journal  
Customers in Training Set

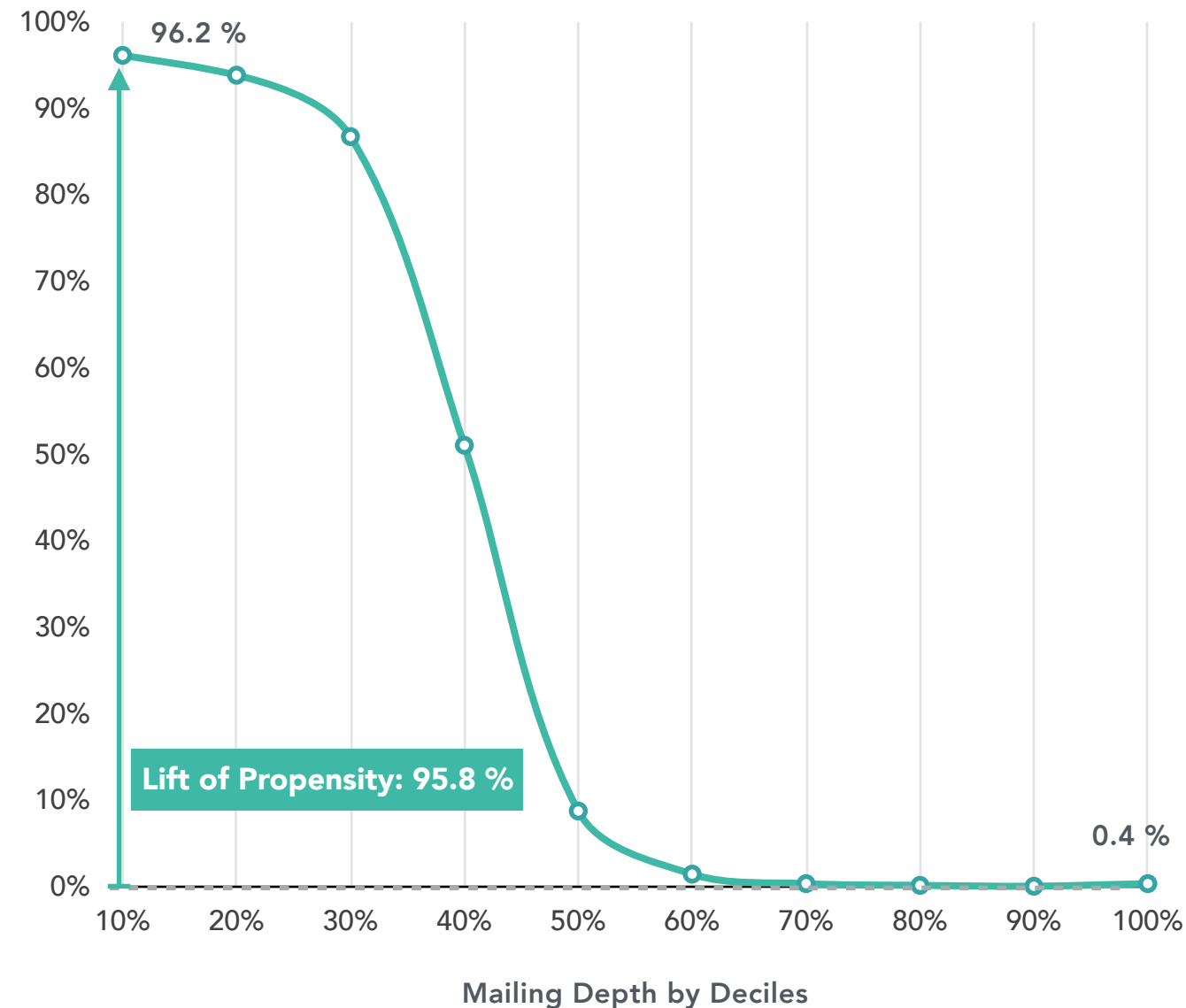


### Gains Charts Of Responders And Decile Propensity

Percent of Responders



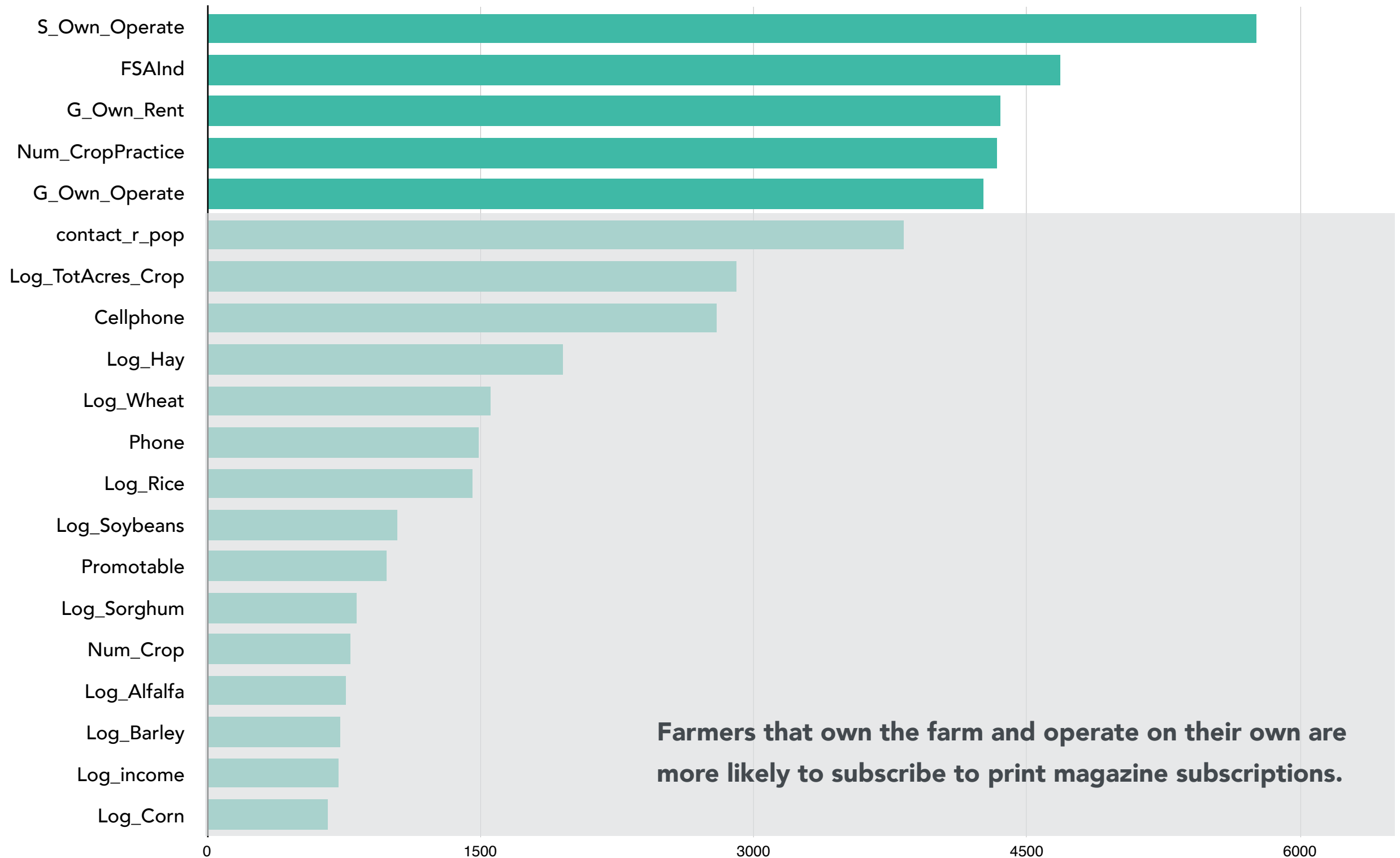
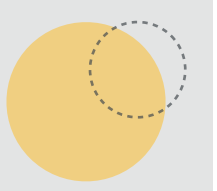
Average Propensity by Decile



# MODELING SUBSCRIPTION RESPONSE

What Characteristics Matter?

Modeling Universe :  
493,127 Farm Journal  
Customers in Training Set



# MODELING PROFARMER RESPONSE

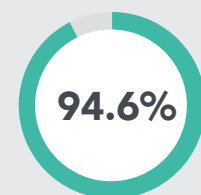
How to cross sell more Profarmer Products

Modeling Universe :  
335,509 Farm Journal  
Customers in Training Set

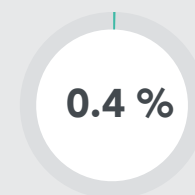


DECILE	N	TOTAL	MEAN	CUMN	CUMSUM	CUMMEAN
1	33,550	10,655	<b>0.318</b>	33,550	10,655	0.318
2	33,551	3,733	0.111	67,101	14,388	0.214
3	33,551	2,256	0.067	100,652	16,644	0.165
4	33,551	1,510	0.045	134,203	18,154	0.135
5	33,551	871	0.026	167,754	19,025	0.113
6	33,551	392	0.012	201,305	19,417	0.096
7	33,551	190	0.006	234,856	19,607	0.083
8	33,551	100	0.003	268,407	19,707	0.073
9	33,550	67	0.002	301,957	19,774	0.065
10	33,552	52	<b>0.002</b>	335,509	19,826	0.059

## MODELING RESULTS



Test Set  
Classification  
Rate



False  
Positive  
Rate



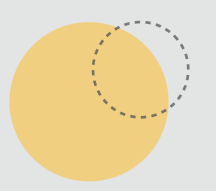
## Propensity Lift

**31.8% Mail Top 10%**  
**44.0% Mail Top 5%**

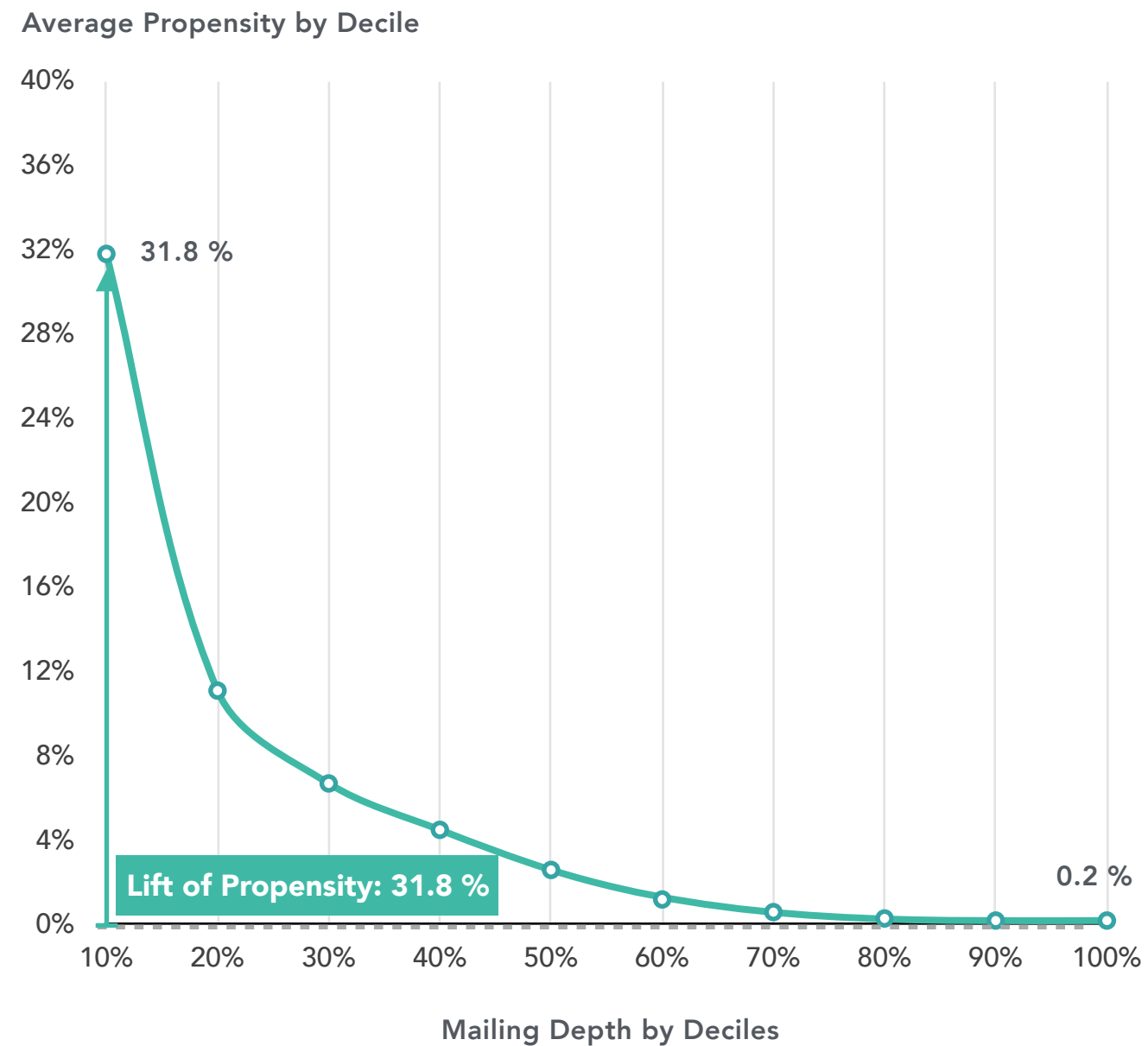
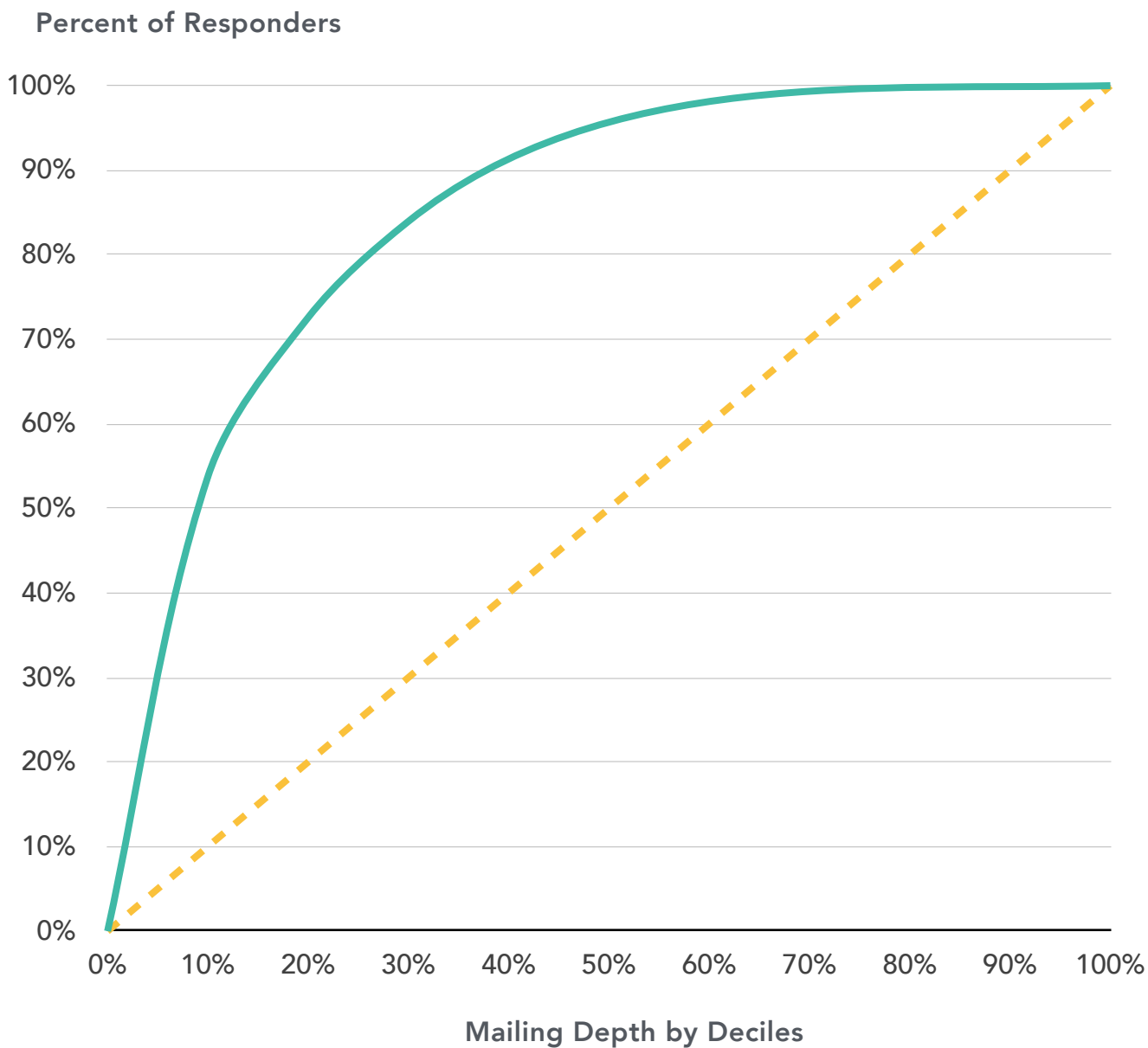
# MODELING PROFARMER RESPONSE

## Modeling Results and Lift

**Modeling Universe :**  
335,509 Farm Journal  
Customers in Training Set

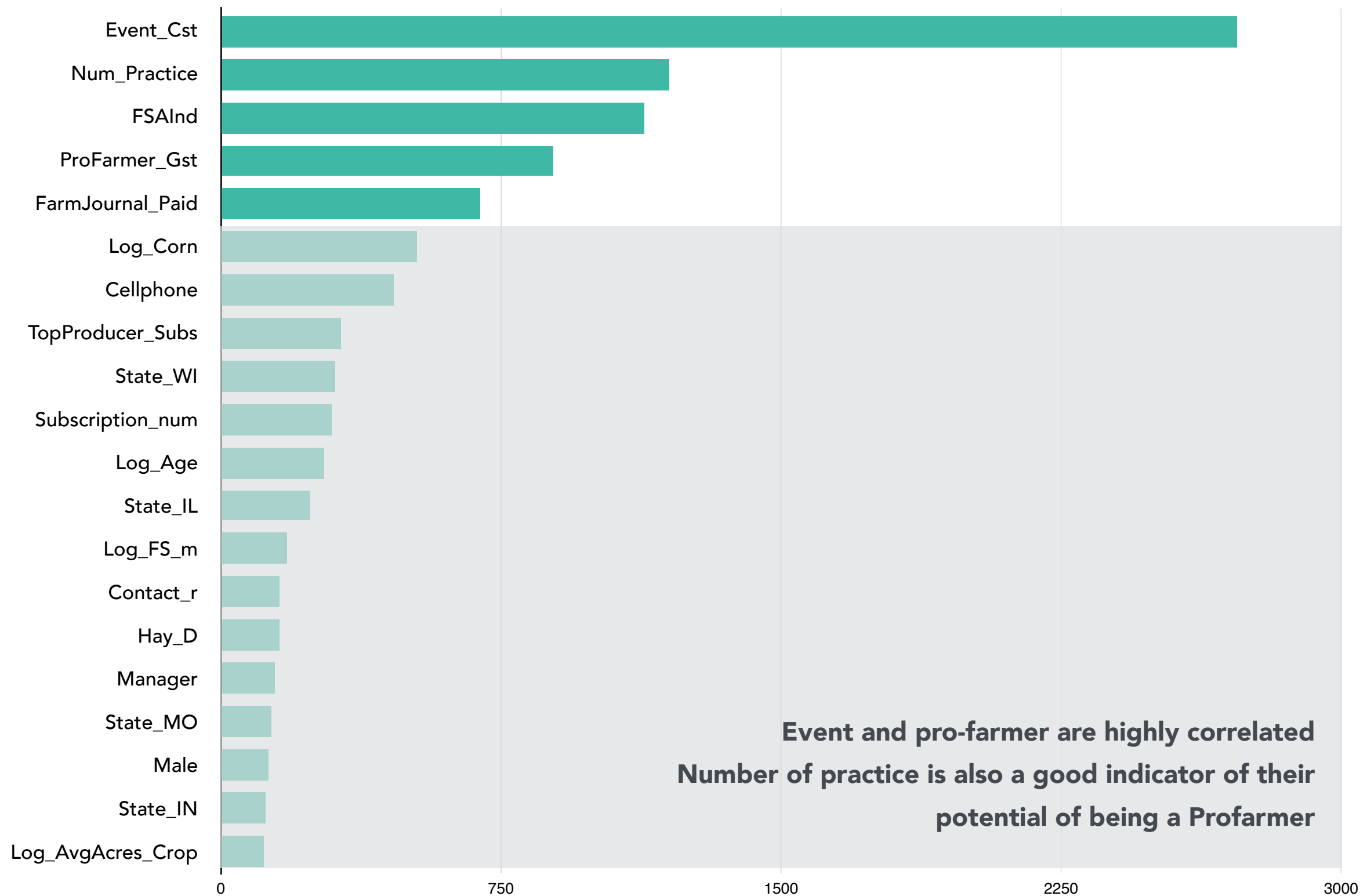


### Gains Charts Of Responders And Decile Propensity



# MODELING PROFARMER RESPONSE

What Characteristics Matter?



## FINAL MODEL RECOMMENDATION

MODEL WINNER: **TWO-STEP MODEL**



## INTRODUCTION TO TWO STEP MODEL

Why And How To Use A Two-Step Model

TWO-STEP MODEL IS **A Combination Of A Response Model & Conditional Spend Model**

### WHY A TWO-STEP MODEL?

Because the expected spend is **conditional** on the propensity of response

... the variables predicting whether a customer will respond are different from those predicting from those predicting how much a customer will spend if the customer responds. Combining these separate behaviors — response and spend conditional on response — creates modeling difficulties.

— **Edward Malthouse, 2013**

### HOW TO IMPLEMENT

1. Estimate the probability that the customer will respond to the contact.
2. Estimate the amount spent.
3. The predictions from the two models are multiplied to give the final score.

$$E(Y) = E[E(Y|R)] = (1 - \pi) E(Y|R=0) + \pi E(Y|R=1) = \pi E(Y|R=1)$$



# MODELING PROFARMER EXPECTED SPEND

How to cross sell more Profarmer Products: **Two Step Model**

Modeling Universe :  
335,509 Farm Journal  
Customers in Training Set



DECILE	N	TOTAL	MEAN	CUMN	CUMSUM	CUMMEAN
1	33,550	\$2,918,950	<b>\$87.00</b>	33,550	\$2,918,950	\$87.00
2	33,551	\$4,439,096	\$132.31	67,101	\$7,358,046	\$109.66
3	33,551	\$4,141,726	\$123.45	100,652	\$11,499,773	\$114.25
4	33,551	\$2,973,346	\$88.62	134,203	\$14,473,119	\$107.85
5	33,551	\$1,447,653	\$43.15	167,754	\$15,920,772	\$94.91
6	33,551	\$1,390,046	\$41.43	201,305	\$17,310,817	\$85.99
7	33,551	\$796,713	\$23.75	234,856	\$18,107,530	\$77.10
8	33,551	\$495,880	\$14.78	268,407	\$18,603,410	\$69.31
9	33,551	\$242,864	\$7.24	301,958	\$18,846,274	\$62.41
10	33,551	\$246,370	<b>\$7.34</b>	335,509	\$19,092,644	\$56.91

MODELING  
RESULTS



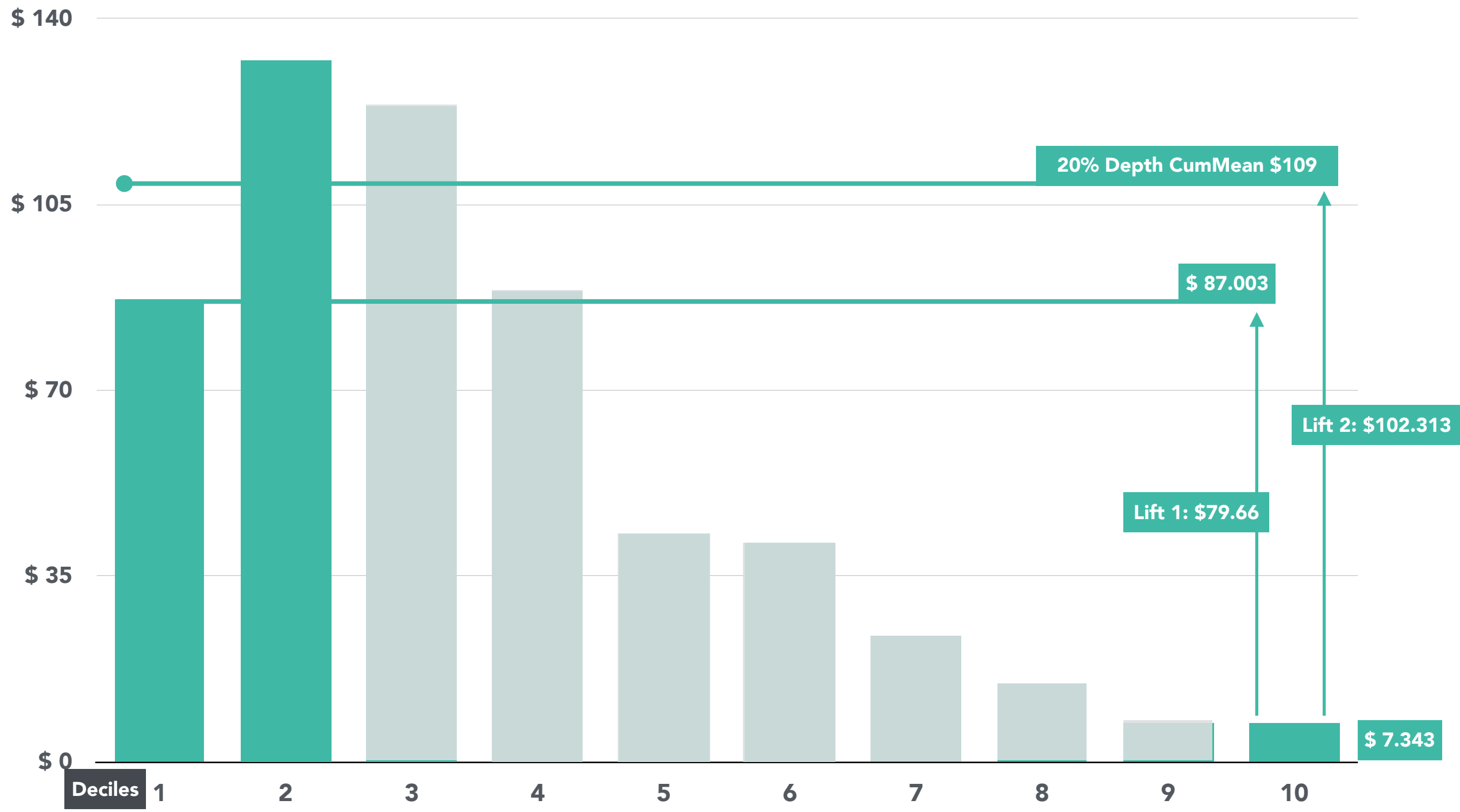
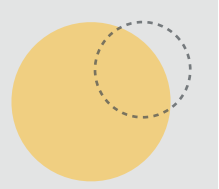
Average Revenue by Decile Lift

**\$ 79.66** Mail Top 10% | **\$ 86.24** Mail Top 5%

# MODELING PROFARMER EXPECTED SPEND

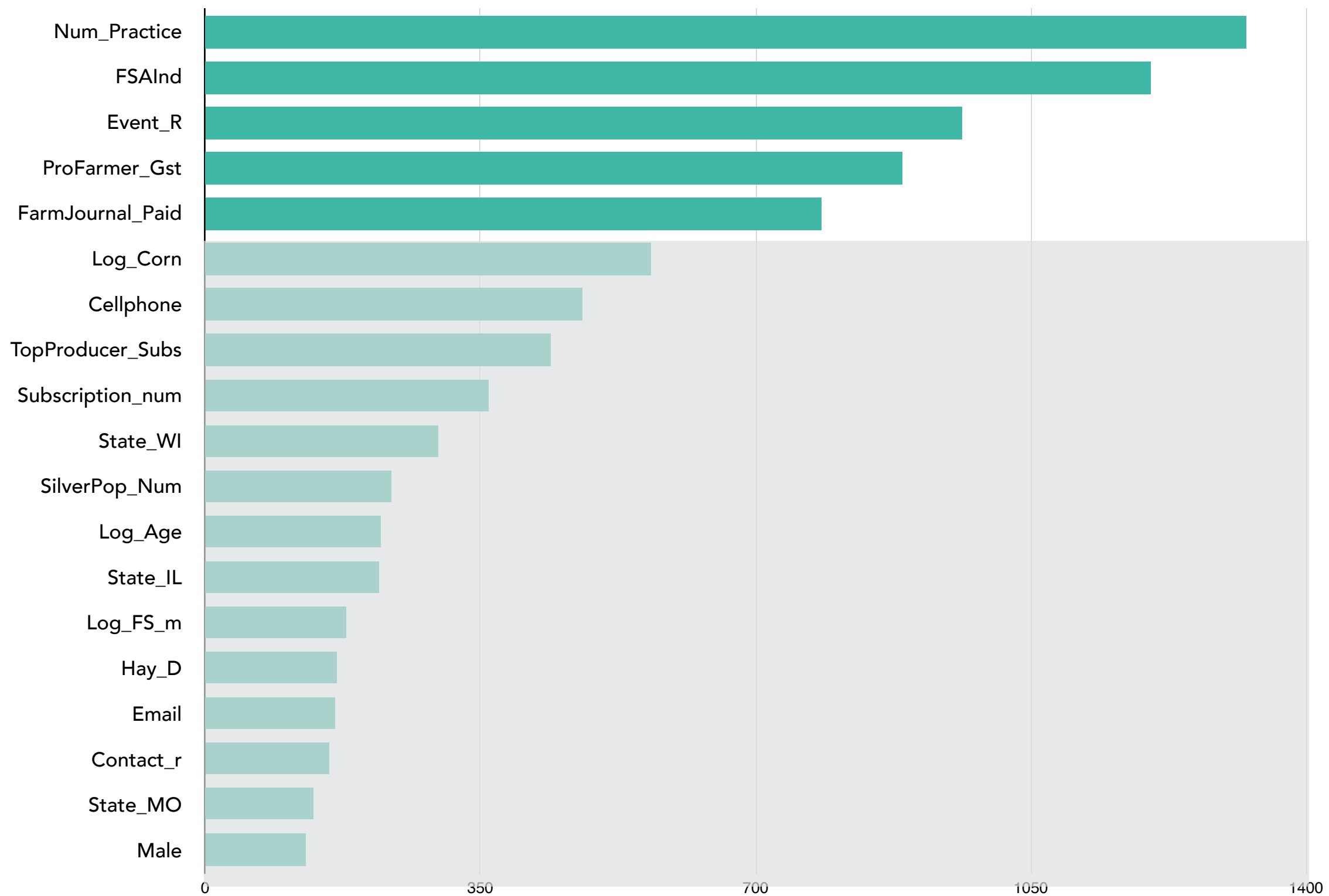
Modeling Results and Lift

Modeling Universe :  
335,509 Farm Journal  
Customers in Training Set



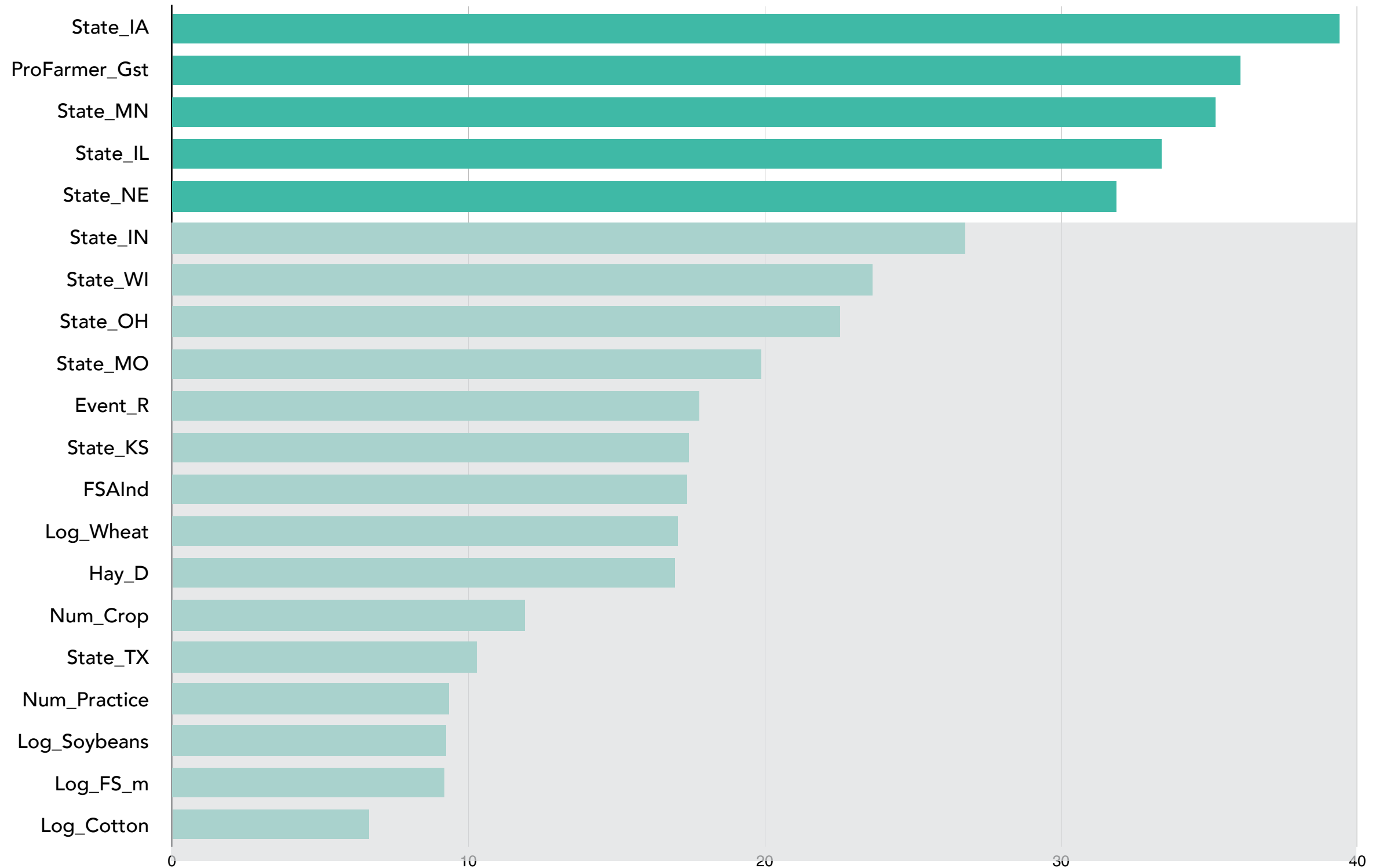
# MODELING PROFARMER RESPONSE

What Characteristics Matter?



# MODELING PROFARMER RESPONSE

What Characteristics Matter?





**THANK YOU ED & MARTIN!**

For this opportunity

**WHERE MINERS MEET FARMERS**



# APPENDIX