

Nitrogen and Phosphorus Recalibration for Sunflower

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Nitrogen and phosphorus recommendations for sunflower haven't changed in about 40 years.

General recommendations for N in North Dakota

N rate = (Yield X 0.05) – credits

P recommendations assume critical level of 20 ppm. Significant P rates 15 ppm and less.

Also, N rate studies were conducted in one oil seed and one confection sunflower site in both 2012 and 2013.

Oil seeds near Valley City

Confections near Mayville

Experimental design- 2012-2013

RCB, 6 treatments- 0-200 lb N/acre

4 replications

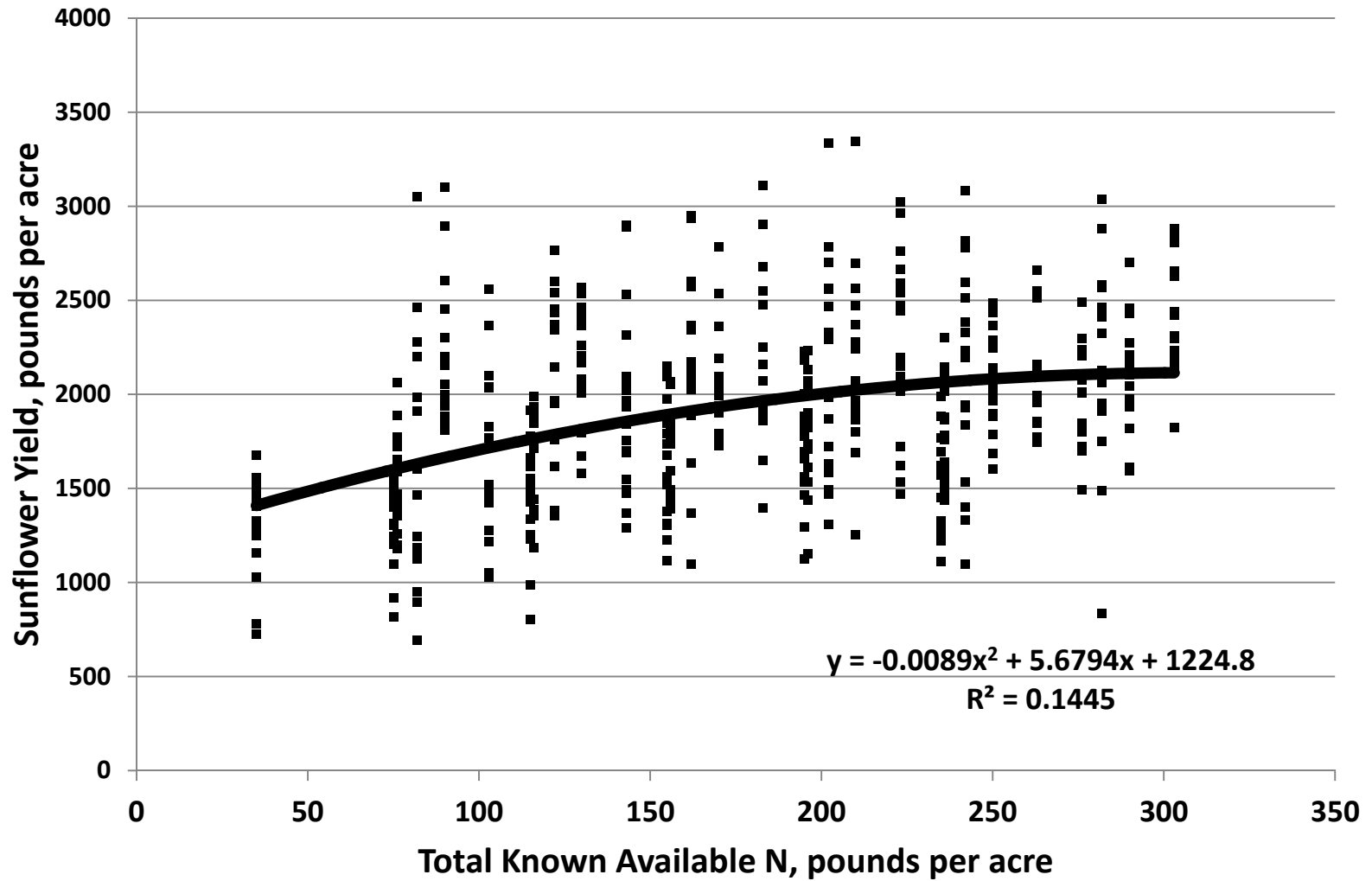
2014-

RCB, split-plot

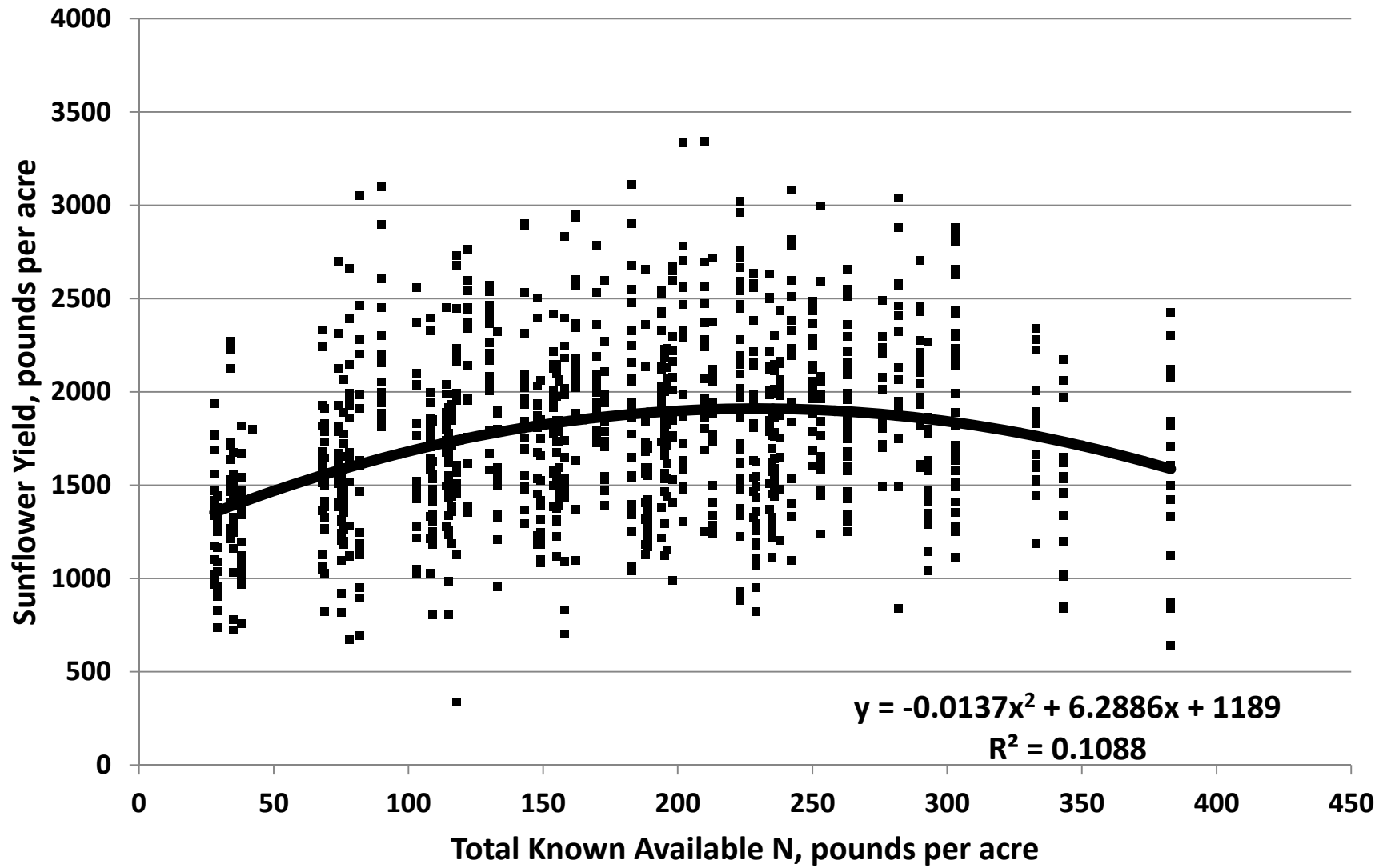
**Main plots- 6 N treatments 0-200 as
ammonium nitrate or Agrotain-treated urea**

**Sub-plots- 4 P treatments 0-90 lb P₂O₅ as
0-46-0**

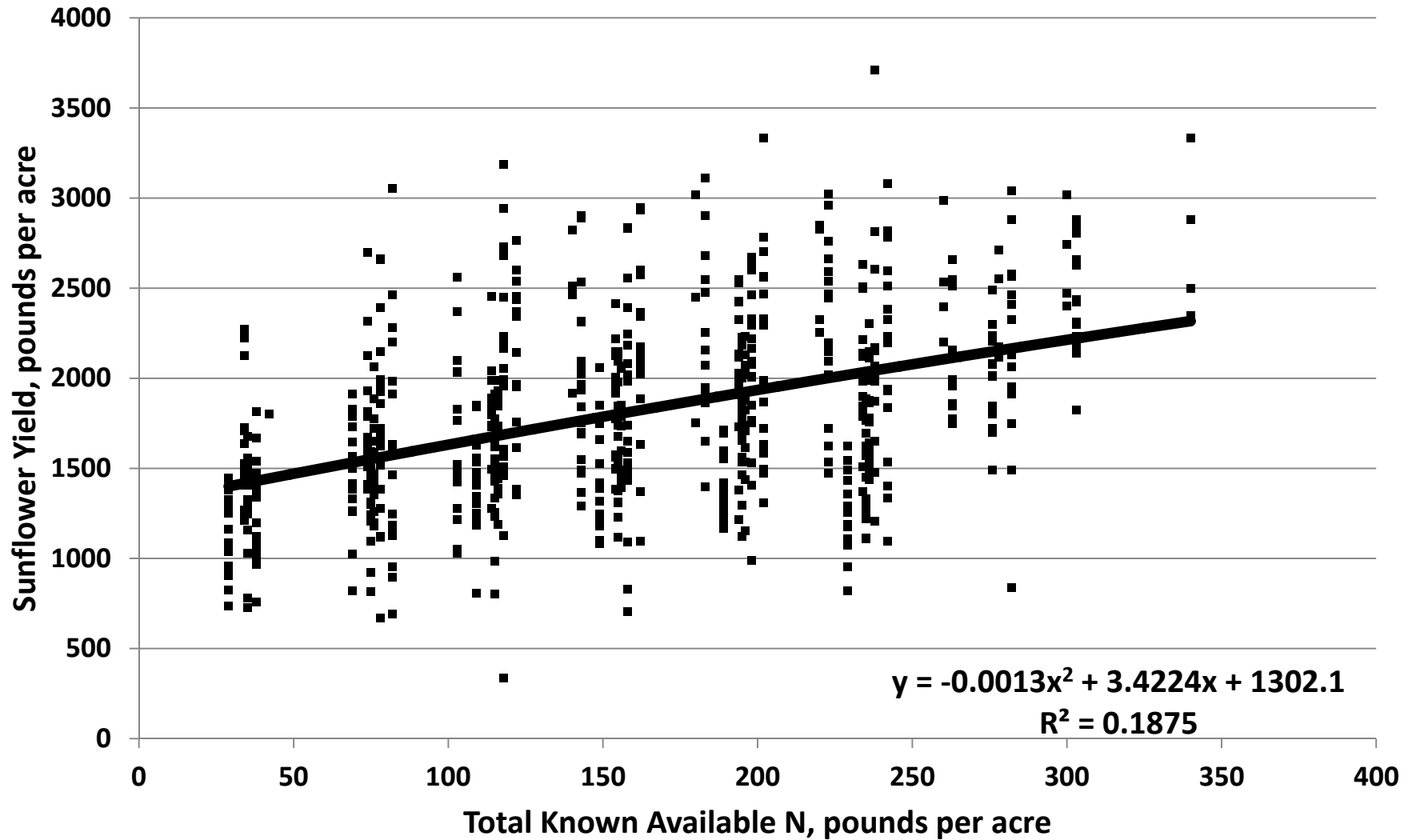
Sunflower Yield, Total Known Available N



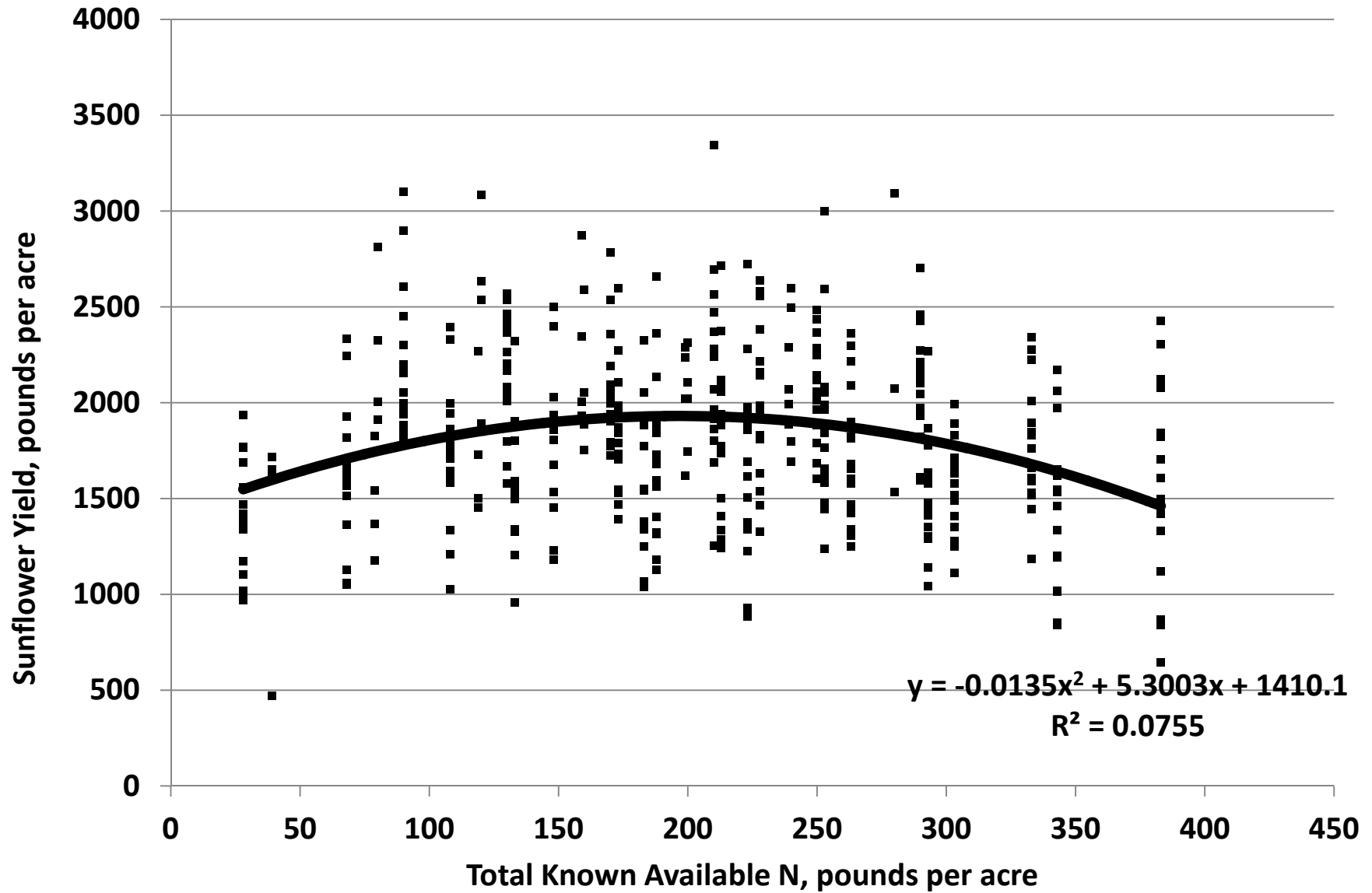
All Sites 2014, Sunflower Yield with Total Available N



Sunflower Yield with Total Known Available N, All Oilseed Sites



Confection Sunflower 2014 and 2012/2013 N rate Trials vs Return to N

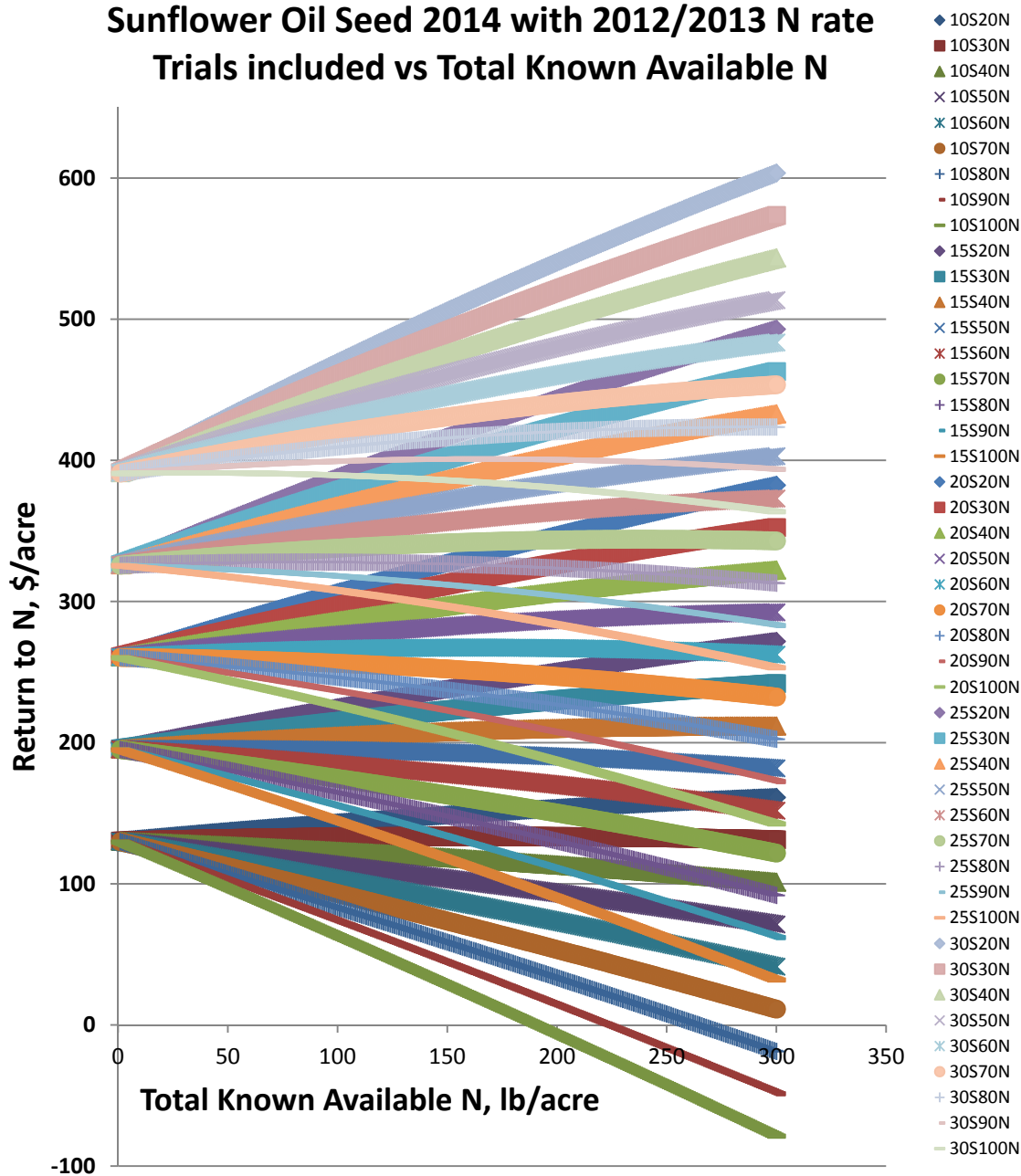


The “Return to N” model-

**Developed by John Sawyer, Iowa State
and Emerson Nafziger, Illinois
(2005, Proc. Ext-Ind Soil Fert. Conf.)**

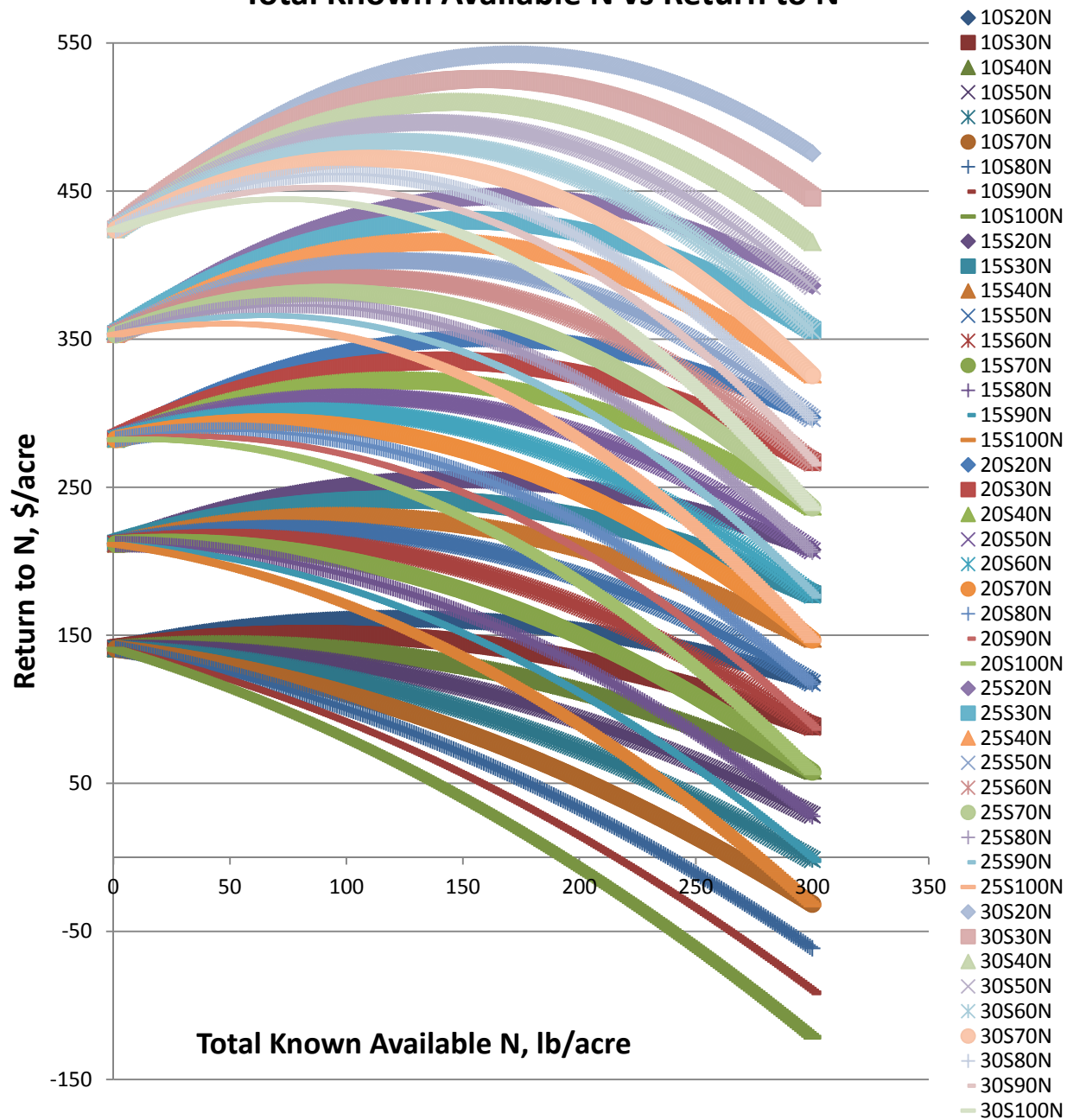
**This model is used in several corn-belt
states, including
Iowa, Illinois, Wisconsin, Minnesota,
Ohio, and Michigan**

Sunflower Oil Seed 2014 with 2012/2013 N rate Trials included vs Total Known Available N



Confection Sunflower 2014 with 2012/2013 N rate trials

Total Known Available N vs Return to N



P response, 11 ND sites, 2014

Site	P test	Response?	Ave Yield	Yield increase w/90 lb P ₂ O ₅
Hazelton	19	No	1750	0
Walcott (c)	12	No	2130	0
Cummings (c)	21	No	1600	0
Valley City	16	No	1500	0
Beach	14	No	1350	0
Belfield	17	Yes	1900	220
Amidon	5	Yes	1750	320
DickinsonS	8	No	1700	0
Heil (Elgin)	9	No	2100	0
Hazen	18	No	2050	0
DickinsonN (c)	32	No	1750	0

Moving forward-

- **Finish analysis of SD sites and Linton ND site, and incorporate into data set**
- **Next spring- at least 12 ND sites, 4 SD sites**
Split plot- 2 P rates (0 and 60 P2O5)
within same 6 N rates
(0,40,80,120,160,200 lb N/acre)

Goal-

Have new N and P recommendations ready by spring planting, 2016.