Corn N Management Update

Soil, Water, & Nutrient Management Meetings
November 30 – December 9, 2010

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SOIL SCIENCE
University of Wisconsin-Madison

UW Extension

Photo: Jeff Osterhaus

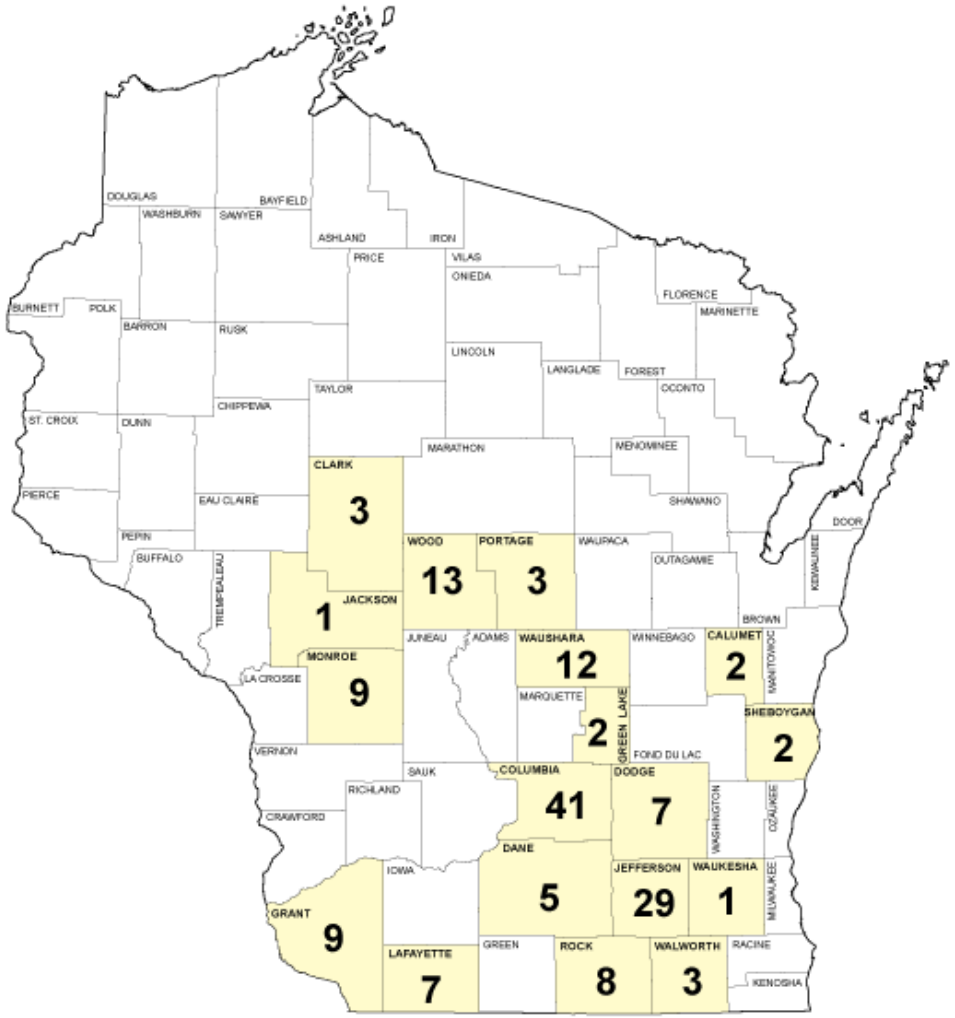
MRTN

Why did MRTN change in 2010?

- New data has been accumulating
  - 2006-2009 growing seasons

Soil yield potential	Previous crop	Sites added since 2005
High/very high	corn	14
	soybean	24
Medium/low	corn	8
	soybean	9
Irrigated sands & loamy sands	All	1
Non-irrigated sands & loamy sands	All	6

Where are all the MRTN sites located?



Location of MRTN trials comprising the Wisconsin corn N response database (April 2010)

MRTN 2010

University of Wisconsin Nitrogen Guidelines for Corn

N:Corn Price Ratio (see table on other side)

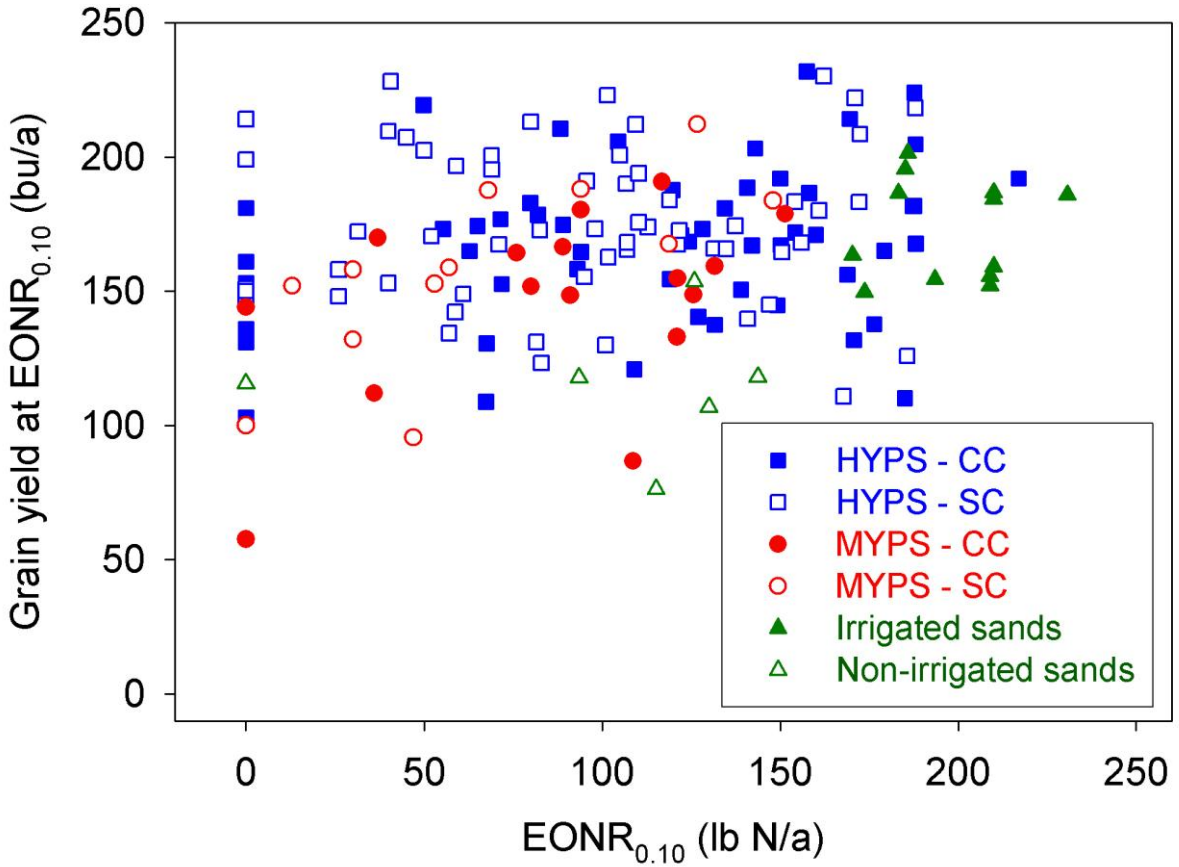
Soil[1]	Previous Crop	0.05	0.10	0.15	0.20
		lbs N/acre (total to apply)[2]			
high/very high yield potential soils	**Corn**, Forage legumes, Legume vegetables, Green manures[5]	**170**[3] 155-----185[4]	**150** 135----160	**130** 120----145	**115** 105---125
	Soybean, Small grains[6]	**140** 125------160	**120** 105-----135	**105** 95---115	**95** 80----105
medium/low yield potential soils	**Corn**, Forage legumes, Legume vegetables, Green manures[5]	**125** 110-----140	**110** 100--115	**100** 95--110	**95** 85--100
	Soybean, Small grains[6]	**110** 90------125	**85** 70----95	**70** 60---80	**60** 50---70
sands/ loamy sands	Irrigated—**All crops**[5]	**215** 205---225	**205** 195---215	**195** 180----205	**180** 170----195
	Non-irrigated—**All crops**[5]	**140** 130---150	**130** 120---140	**120** 110---130	**110** 100---120

N:Corn Price Ratio Table

Price of N* ($/lb N) \ Price of Corn ($/bu corn)	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00
0.20	0.07	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.03	0.03
0.25	0.08	0.08	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04
0.30	0.10	0.09	0.09	0.08	0.08	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05
0.35	0.12	0.11	0.10	0.09	0.09	0.08	0.08	0.07	0.07	0.07	0.06	0.06	0.06
0.40	0.13	0.12	0.11	0.11	0.10	0.09	0.09	0.08	0.08	0.08	0.07	0.07	0.07
0.45	0.15	0.14	0.13	0.12	0.11	0.11	0.10	0.09	0.09	0.09	0.08	0.08	0.08
0.50	0.17	0.15	0.14	0.13	0.13	0.12	0.11	0.11	0.10	0.10	0.09	0.09	0.08
0.55	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.10	0.10	0.10	0.09
0.60	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.13	0.12	0.11	0.11	0.10	0.10
0.65	0.22	0.20	0.19	0.17	0.16	0.15	0.14	0.14	0.13	0.12	0.12	0.11	0.11
0.70	0.23	0.22	0.20	0.19	0.18	0.16	0.16	0.15	0.14	0.13	0.13	0.12	0.12
0.75	0.25	0.23	0.21	0.20	0.19	0.18	0.17	0.16	0.15	0.14	0.14	0.13	0.13

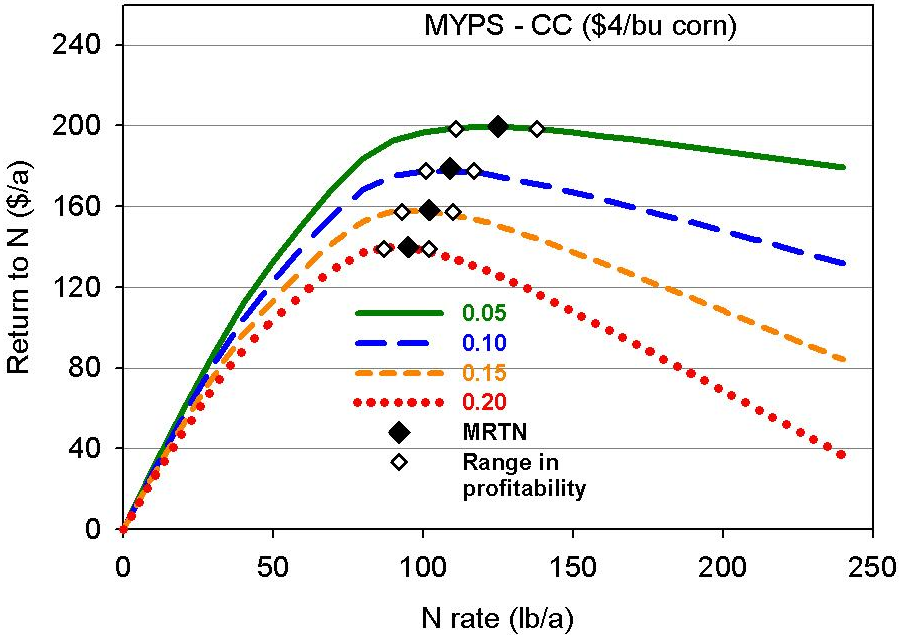
***Price of N = [$/ton fertilizer x (100 / % N in fertilizer)] / 2000**

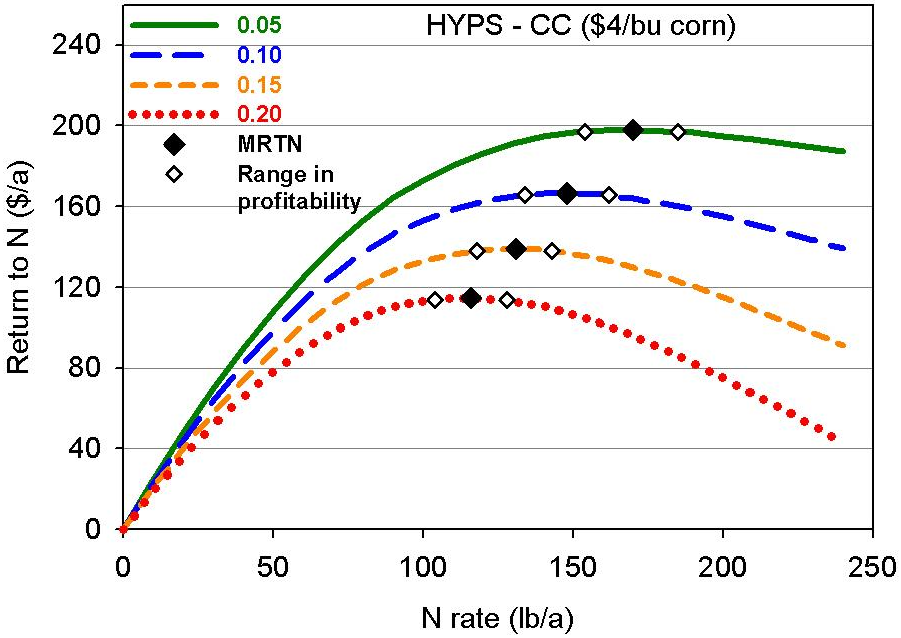
There is still no relationship between the economic optimum N rate & Yield



Soil's N contribution to yield is significant!

Soil Yield Potential	Previous Crop	Yield at 0 lb N/a	Maximum Yield	Relative Yield
		bu/a	bu/a	%
High/very high	Corn	110	169	65
	Soybean	130	176	74
Medium/low	Corn	91	148	61
	Soybean	134	158	85
Sands/loamy sands	All irrigated	61	174	35
	All non-irrigated	61	118	52


MYPS - CC ($4/bu corn)
Return to N ($/a)
N rate (lb/a)
0.05
0.10
0.15
0.20
MRTN
Range in profitability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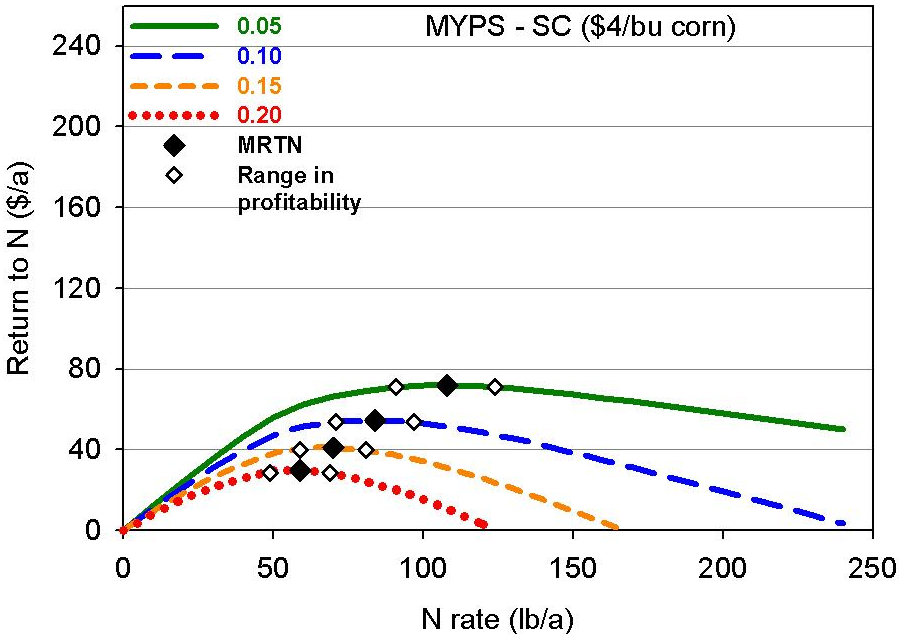
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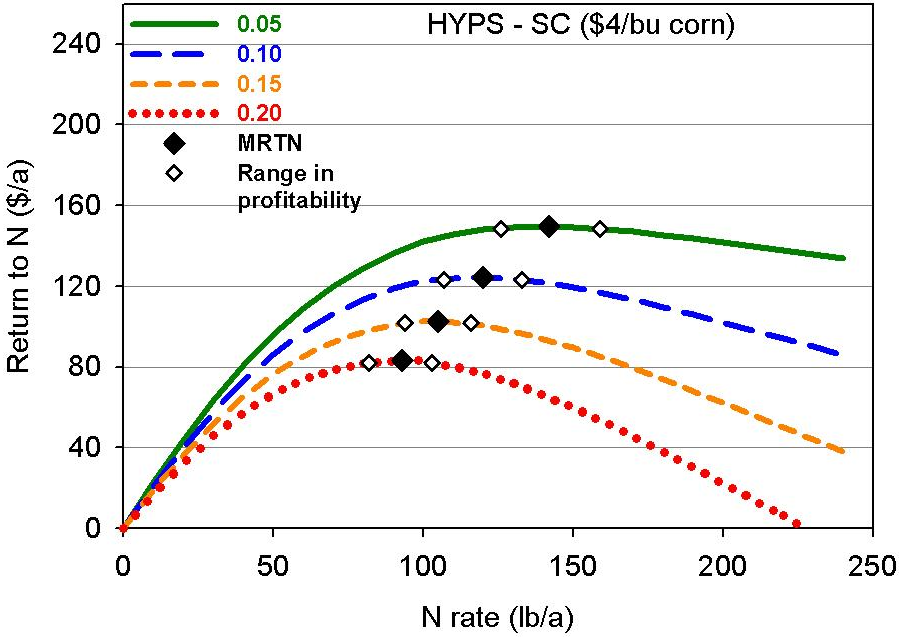
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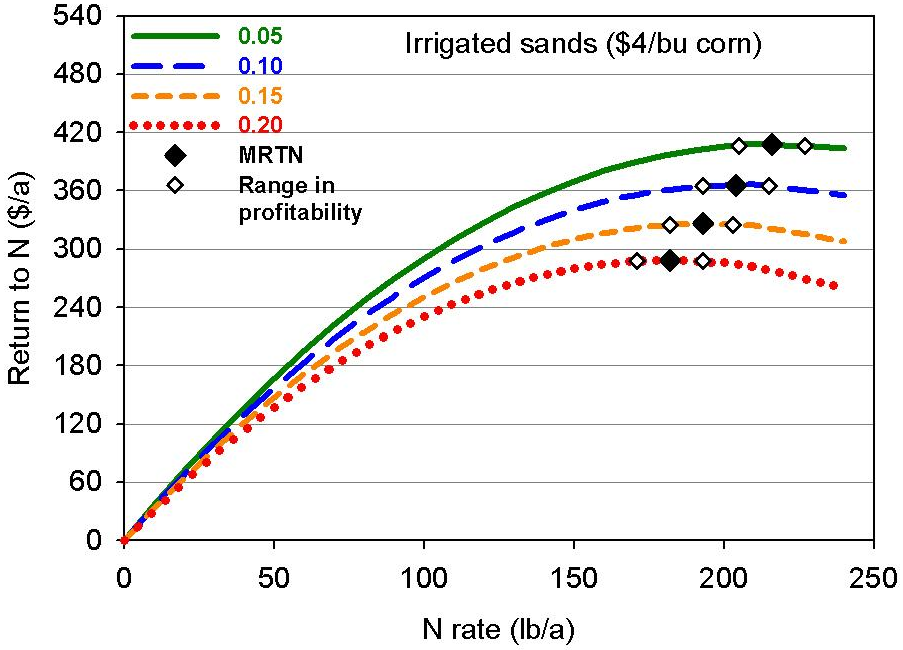

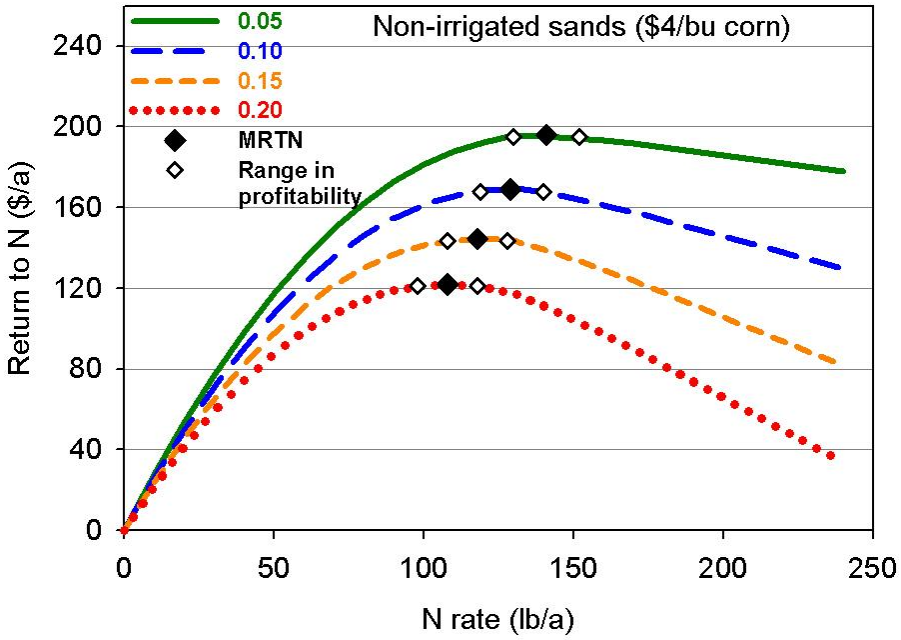

Note scales are different!

Photo: Sam Kweskin

Instinct®

Effect of Instinct applied preplant with 28% UAN at Arlington in 2008-2010

Year	N rate	Instinct		
		Without	With	Mean
	lb N/a	---- Yield (bu/a) ----		
2008	80	168	174	171 b
	120	178	181	180 a
	mean	173	178	
2009	40	190	194	192 b
	80	201	198	200 a
	mean	196	196	
2010	40	194	198	196 a
	80	199	204	202a
	mean	196	201	

Instinct p = 0.25 (2008), p = 0.91 (2009), p = 0.14 (2010)

N rate p = 0.04 (2008), p = 0.03 (2009), p = 0.05 (2010)

Year	May	June	July
	Rainfall departure from normal (inches)		
2008	-0.2	9.6	1.0
2009	0.3	0.3	-1.7
2010	0.7	3.6	5.4

Year	Preplant	Sidedress
	$EONR_{0.10}$ (lb N/a)	
2008	144	113
2009	69	59
2010	96	57

Instinct costs ~$10/a