



Wheat N Topdress Fertilizer Study

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Wheat N Topdress Fertilizer Study

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Wheat N Topdress Fertilizer Study



Background:

Are we using the correct amount of Nitrogen when topdressing our dryland wheat?

We have been using a simple equation to determine the amount to apply based on yield goal, previous crop, carry-over nitrogen, starter fertilizer, and other topdress applications.



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Background:

This is a continuation of a study from 2004, 2005, 2006 and 2007.



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Background:

$$\begin{array}{r} \text{Yield} \\ \text{goal} * \\ 1.8 \end{array} \quad \text{minus} \quad \begin{array}{l} \text{(carryover)} \\ \text{(starter fertilizer)} \\ \text{(other applications)} \end{array} \\ = \quad \text{Topdress amount}$$

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Methodology

We applied uniform rates of N during the winter or early spring on winter wheat each year.

Each year we changed the rate either up or down by about 20# N

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Methodology

We have harvested the grain and yield mapped the data.

We select yield data that falls within a treatment and calculate an average yield for the treatment.


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Methodology

We end up with pairs of data that represent two levels of Nitrogen topdressed.


All trials



2004			2005		
Trial ID	+20 #N	Base Rate	Trial ID	+20 #N	Base Rate
Gayles80	59.91	59.12	Wyatt 2	28.40	29.94
Davis	53.80	52.84	Wyatt 3	34.31	36.38
Jobe	69.84	69.61	Davis	35.85	36.18
Julies80	60.57	61.25	Julie80	26.41	26.09
Julies 56#	42.77	37.66	N10 1	46.48	43.63
Julies 115#	50.91	44.73	N10 2	54.66	50.77
Varney	71.63	66.87	SE3	58.25	56.94
Wyatt	54.50	52.45	Thode1	55.48	51.93
			Thode2	38.93	36.92
			Thode3	48.72	48.71
			SE12	50.14	48.58
			SE32	49.09	47.06


2006	Field	Base N	-20 #N	Base - low
	SE 21	44.7	45.7	-1.0
	3-80s 1	47.7	43.7	4.1
	3-80s 2	42.3	36.4	6.0
	3-80s 3	47.6	50.0	-2.4
	3-80s 4	46.1	42.7	3.4
	NE 27	44.8	36.6	8.2
	NE 22	60.9	62.5	-1.6
	SE 3	43.7	42.1	1.6
	SE 32 1	46.5	43.7	2.8
	SE 32 2	15.9	19.3	-3.4
	Ethels 80	28.9	26.1	2.8
	Mean	42.6	40.8	1.9

All Data from 2007



Field	yield	N applied	total N
Trotter	25.2	60.1	90.1
Trotter	21.4	40.0	70.0
S2 28 NW	34.4	44.9	82.4
S2 28 NW	31.6	25.1	62.6
S2 28 NE	29.6	44.9	82.4
S2 28 NE	28.9	25.1	62.6
S2 28 SW	20.4	44.9	82.4
S2 28 SW	21.7	25.1	62.6
S2 28 SE	23.5	44.9	82.4
S2 28 SE	22.9	25.1	62.6
Colle Qtr	21.0	0.0	65.0
Colle Qtr	23.5	25.1	90.1
CAM15W	28.4	60.1	90.1
CAM15W	25.2	40.0	70.0
CAM15E	36.6	60.1	90.1
CAM15E	35.1	40.0	70.0
SE 12	18.5	0.0	58.0
SE 12	19.7	25.1	83.1

2008 yield data



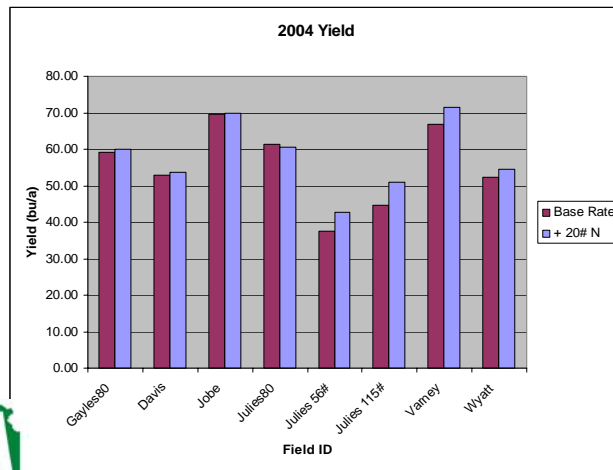
	yield	N applied	total N
Trotter	54.7	25	55
Trotter	43.0	0	30
S/2 28 West	72.4	40	77
S/2 28 West	66.3	20	57
S/2 28 East	66.7	40	77
S/2 28 East	59.5	20	57
RVM Home	77.8	30	92
RVM Home	75.6	15	77
RVM Home	78.0	30	92
RVM Home	65.1	0	62
Hard 40	67.2	21.74968	58.44968
Hard 40	67.1	20	56.7
Jobe	56.8	89.77	129.77
Jobe	42.0	20	60
SW 29 Irr	60.3	41.52578	77.02578
SW 29 Irr	62.8	70	105.5

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Methodology

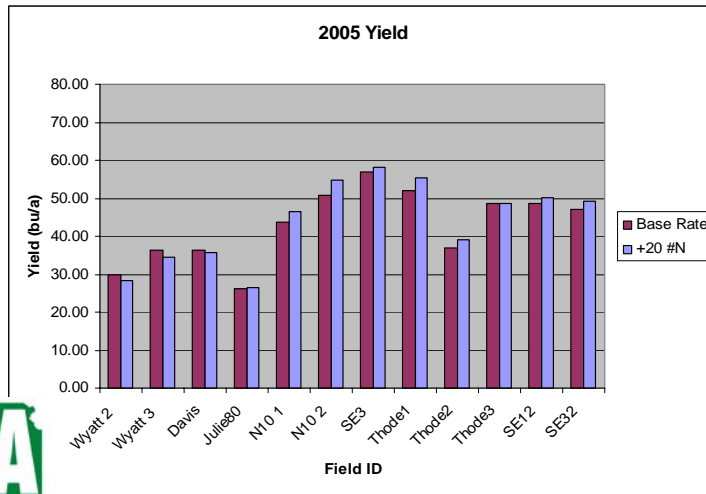
We looked at the data in several ways, but the most promising analysis came from adding all sources of N: Topdress, Starter, Carryover (from soil tests)

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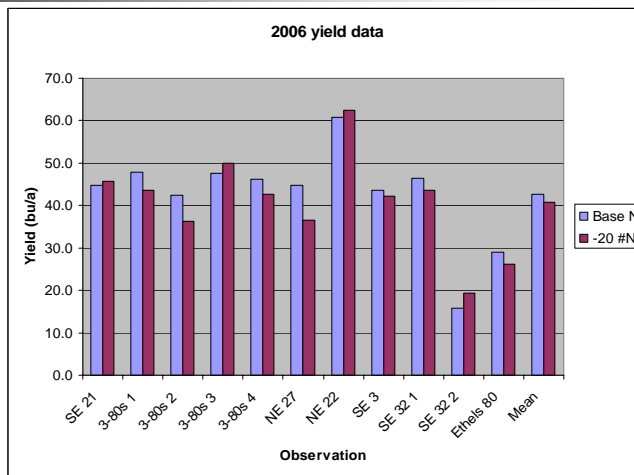




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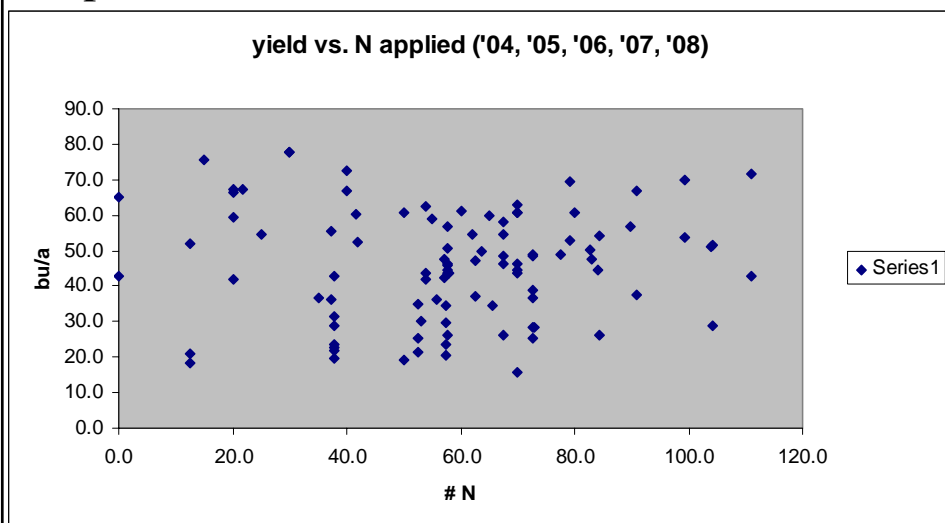


Methodology

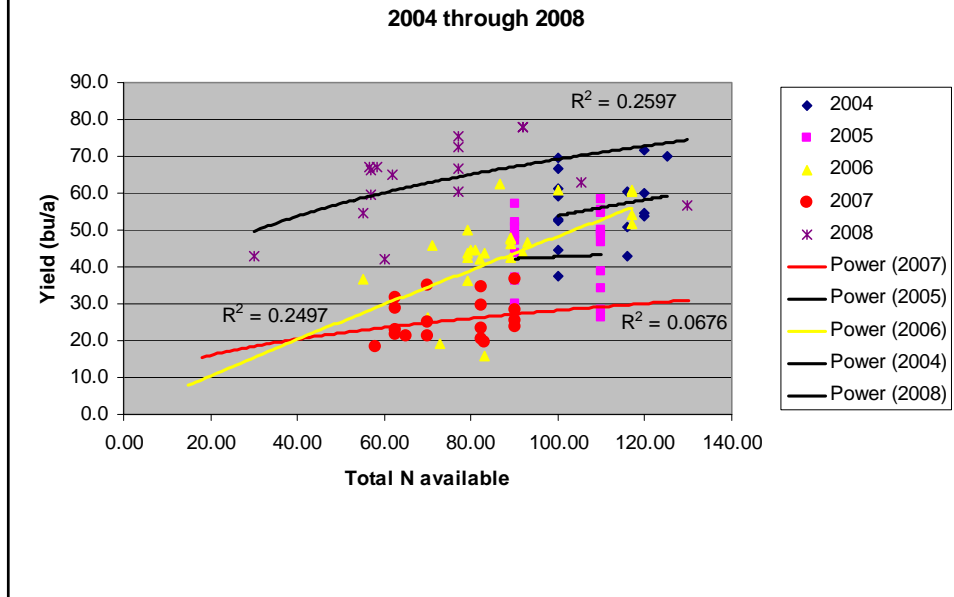
A more promising way to evaluate the data was to look at yield vs. the total N available to the plant.

Total available was calculated by adding Topdress N + Starter N + Carryover N (from soil test) + any other sources.

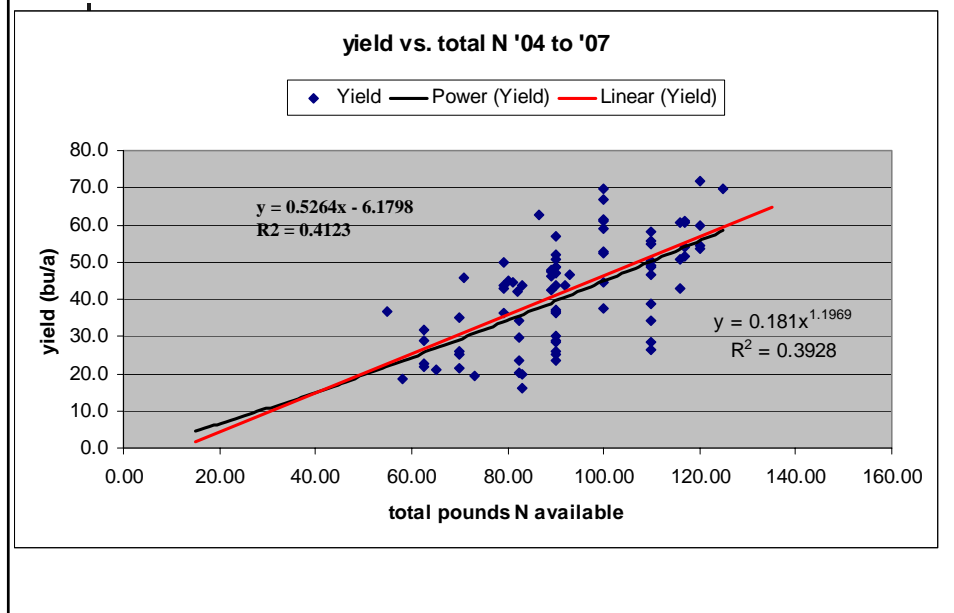
All points from 2004, 2005, 2006, 2007 & 2008



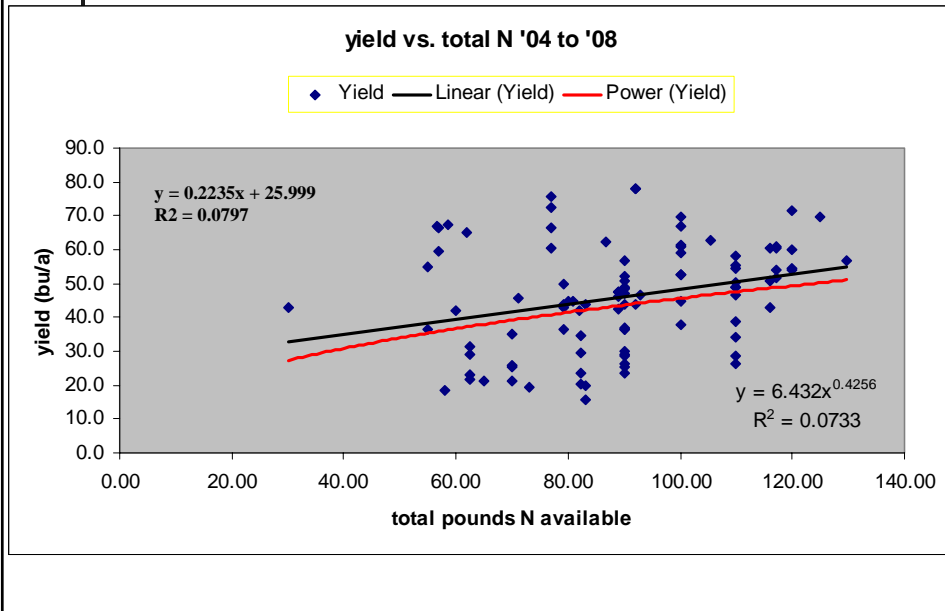
All points from 2004, 2005, 2006, 2007 & 2008



All points from 2004, 2005, 2006, & 2007



All points from 2004, 2005, 2006, 2007 & 2008



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Using '04 to '07 we have a curve function with an R^2 of 0.4123

Adding '08, the new curve function has an R^2 of 0.0797.

So, with more data, we have less confidence in our ability to predict a yield



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What I learned:

We're much better at getting out the data for analysis. I'm more excited about looking at the data than collecting it.



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Where we go from here:

I'm ready to tackle the idea of determining the effectiveness of our variable rate applications and look forward to devising methods to check and verify or modify our system.



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Questions and Discussion

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Thank You!!

Thanks to KARA for funding for this project.
Thanks to Dr. Terry Kastens for assistance on
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Thanks to Margaret Scheufler and Dan Taylor
for really doing the hard parts of this project.

