

## FIELD EXPERIMENT HISTORY

**Title: The Ability of Nitrification Inhibitor (SuperU) ratios to Increase Corn Grain Yield in WI Soils.**

**Experiment:** 12Fertilizer **Trial ID:** 5932 **Year:** 2014

**Personnel:** J.G. Lauer, T. Diallo, K.D. Kohn and M. Kazula

**Location:** Arlington, WI **County:** Columbia

**Supported By:** HATCH, WI Fertilizer Research Council, CSCAP

### Site Information

**Field:** ARS367 **Previous Crop:** Soybeans **Soil Type:** Plano Silt Loam  
**Soil Test: Date:** 11/11/2014 **pH:** 7.1 **OM (%)** 2.8 **P (ppm)** 84 **K (ppm)** 207

### Plot Management

**Tillage Operations:** Notill N/A

<b>Fertilizer:</b>		<u>Analysis</u>	<u>Rate</u>	<u>Date</u>
	<b>Preplant</b>	N/A	N/A	N/A
	<b>Starter</b>	N/A	N/A	N/A
	<b>Post plant</b>	46-0-0	See Factors	6 /9 /14
	<b>Manure:</b>	N/A	None	

**Herbicide:** Round up PowerMax 18 oz/A 6/6/14 **Insecticide:** N/A  
 Hornet 3.0 oz/A 6/6/14  
 Dual II Magnum 24 oz/A 6/6/14

**Irrigation:** None **Hybrid:** See Factors

**Planting Date:** 5/20/14 **Planting Depth:** 1.5" **Row Width:** 30"

**Target Plant Density:** 35000 plants per acre **Planting Method:** JD 1700 Planter with RTK

**Harvest Date:** 11/7/14 **Harvest Method:** Massey 8XP

**Notes:**

### Experimental Design

**Design:** RCB split-plot with 2x6 Factorial

**Replications:** 4

**Plot Size Seeded:** 25' x 10'

**Experiment Size:** 0.66 A

**Harvest Plot Size:** 5' x 22'

**Harvest Plant Density:** 31317 plants per acre

**Factors/Treatments:**

#### Hybrid

A - (RR) GH G01P52-3011A  
 B - (SS) DK DKC48-12

#### N Rates and N Source Ratios (SuperU:Urea)

	lb/A	lb/A
1.	0 (160)	7. 160 100_0
2.	0 (190)	8. 190 0_100
3.	160 0_100	9. 190 25_75
4.	160 25_75	10. 190 50_50
5.	160 50_50	11. 190 75_25
6.	160 75_25	12. 190 100_0

**Results: Table 1412-01 & 1412-02**

**Table: 1412-01. The Ability of Nitrification Inhibitor (SuperU) ratios to Increase Corn Grain Yield in WI Soils. Arlington, WI - 2014.**

Hybrid	Nitrogen Rate lb/A	SuperU:Urea Ratio %	Grain yield bu/A	Grain moisture %	Test weight lb/bu	Lodged			Harvest density plants/A	*AGI \$/A
						Total %	Stalk %	Root %		
(SS) DKC48-12			188	20.9	53.9	1.5	1.4	0.0	31078	626
(RR) GH G01P52-3011A			169	21.2	55.5	0.8	0.8	0.1	31556	561
	0	(160)	121	21.7	54.0	1.9	1.9	0.0	31631	401
	0	(190)	114	22.4	54.0	1.2	1.2	0.0	29255	376
	160	0_100	192	20.9	54.7	0.8	0.8	0.0	32324	640
	160	25_75	179	20.6	54.0	1.9	1.8	0.2	31284	599
	160	50_50	183	21.2	54.7	0.9	0.8	0.2	30789	607
	160	75_25	193	20.4	54.8	1.6	1.6	0.0	31878	646
	160	100_0	195	20.8	54.6	1.2	1.2	0.0	31928	649
	190	0_100	188	20.4	55.2	0.6	0.6	0.0	30641	630
	190	25_75	192	20.5	54.7	0.9	0.9	0.0	32324	639
	190	50_50	198	20.9	56.2	0.8	0.6	0.2	31878	658
	190	75_25	191	21.3	54.6	0.2	0.2	0.0	31383	634
	190	100_0	193	21.0	54.7	1.8	1.8	0.0	30492	644
(SS) DKC48-12	0	(160)	132	20.8	52.9	2.8	2.8	0.0	31284	441
(SS) DKC48-12	0	(190)	126	21.6	53.6	2.5	2.5	0.0	30294	419
(SS) DKC48-12	160	0_100	200	21.2	53.7	0.3	0.3	0.0	32175	666
(SS) DKC48-12	160	25_75	188	20.6	53.7	2.6	2.6	0.0	30492	627
(SS) DKC48-12	160	50_50	197	21.7	54.0	0.6	0.6	0.0	30294	655
(SS) DKC48-12	160	75_25	204	20.0	54.0	2.2	2.2	0.0	31482	683
(SS) DKC48-12	160	100_0	203	21.2	53.8	1.9	1.9	0.0	30987	675
(SS) DKC48-12	190	0_100	196	19.8	54.8	1.0	1.0	0.0	30096	656
(SS) DKC48-12	190	25_75	204	20.5	54.0	1.2	1.2	0.0	32571	680
(SS) DKC48-12	190	50_50	199	20.5	54.1	1.6	1.3	0.3	31680	663
(SS) DKC48-12	190	75_25	204	21.3	54.4	0.0	0.0	0.0	31581	677
(SS) DKC48-12	190	100_0	202	21.1	53.7	1.0	1.0	0.0	29997	671
(RR) GH G01P52-3011A	0	(160)	109	22.6	55.1	1.0	1.0	0.0	31977	360
(RR) GH G01P52-3011A	0	(190)	102	23.2	54.4	0.0	0.0	0.0	28215	334
(RR) GH G01P52-3011A	160	0_100	184	20.7	55.6	1.2	1.2	0.0	32472	615
(RR) GH G01P52-3011A	160	25_75	171	20.6	54.3	1.2	0.9	0.3	32076	571
(RR) GH G01P52-3011A	160	50_50	168	20.8	55.4	1.3	0.9	0.3	31284	560
(RR) GH G01P52-3011A	160	75_25	183	20.8	55.5	0.9	0.9	0.0	32274	609
(RR) GH G01P52-3011A	160	100_0	187	20.4	55.5	0.6	0.6	0.0	32868	623
(RR) GH G01P52-3011A	190	0_100	181	21.1	55.5	0.3	0.3	0.0	31185	604
(RR) GH G01P52-3011A	190	25_75	179	20.6	55.4	0.6	0.6	0.0	32076	599
(RR) GH G01P52-3011A	190	50_50	197	21.3	58.4	0.0	0.0	0.0	32076	654
(RR) GH G01P52-3011A	190	75_25	178	21.2	54.9	0.3	0.3	0.0	31185	591
(RR) GH G01P52-3011A	190	100_0	185	20.9	55.7	2.6	2.6	0.0	30987	616
Mean			178	21.0	54.7	1.1	1.1	0.0	31317	594
<b>Probability(%)</b>										
Hybrid (H)			1.2	62.2	3.3	19.3	17.1	60.9	22.6	0.9
N_Treatment (T)			0.0	0.4	3.7	70.0	68.4	62.2	0.2	0.0
H x T			82.7	8.7	19.1	49.4	51.2	40.5	36.3	85.8
<b>LSD(0.10)</b>										
Hybrid (H)			8	NS	1.0	NS	NS	NS	NS	25
N_Treatment (T)			11	0.8	1.0	NS	NS	NS	1191	38
H x T			NS	1.3	NS	NS	NS	NS	NS	NS

\*AGI: Adjusted Gross Income.

**Table: 1412-02. The Ability of Nitrification Inhibitor (SuperU) ratios to Increase Corn Grain Yield in WI Soils. Greenhouse gases emission - Arlington, WI 2014.**

Day of Year	SuperU:Urea Ratio	CO2 flux mg C m <sup>-2</sup> h <sup>-1</sup>	N2O flux µg N m <sup>-2</sup> h <sup>-1</sup>	CH4 flux µg C m <sup>-2</sup> h <sup>-1</sup>	Day of Year	SuperU:Urea Ratio	CO2 flux mg C m <sup>-2</sup> h <sup>-1</sup>	N2O flux µg N m <sup>-2</sup> h <sup>-1</sup>	CH4 flux µg C m <sup>-2</sup> h <sup>-1</sup>
	%					%			
161		45	10	-6	226	0 (UTC)	98	12	-6
171		126	674	0	226	0_100	101	6	-8
192		94	14	-4	226	50_50	102	10	6
203		80	5	-3	226	100_0	112	9	-2
226		103	9	-3					
254		59	5	-4	254	0 (UTC)	65	4	-8
272		55	4	-7	254	0_100	56	4	-3
286		31	4	-3	254	50_50	51	5	-3
309		19	3	-5	254	100_0	62	5	-2
	0 (UTC)	68	75	-8	272	0 (UTC)	56	3	-27
	0_100	64	100	-3	272	0_100	52	4	3
	50_50	66	56	-1	272	50_50	49	6	-1
	100_0	73	92	-4	272	100_0	61	4	-4
161	0 (UTC)	45	9	-8	286	0 (UTC)	33	7	-6
161	0_100	41	8	-7	286	0_100	31	3	0
161	50_50	41	12	-4	286	50_50	33	5	3
161	100_0	51	10	-7	286	100_0	29	2	-8
171	0 (UTC)	134	624	-2	309	0 (UTC)	22	2	-3
171	0_100	110	852	2	309	0_100	17	3	-5
171	50_50	117	447	0	309	50_50	20	4	-5
171	100_0	143	773	2	309	100_0	19	3	-6
192	0 (UTC)	84	11	-7	Mean		68	81	-4
192	0_100	96	17	-3	<u>Probability(%)</u>				
192	50_50	96	13	-3	DOY (D)		0.0	0.0	76.7
192	100_0	100	16	-4	N_treatment (N)		36.6	88.2	4.9
					D x N		99.9	100.0	70.1
203	0 (UTC)	77	4	-4	<u>LSD(0.10)</u>				
203	0_100	72	6	-4	DOY (D)		20	150	7
203	50_50	86	6	-1	N_treatment (N)		NS	NS	4
203	100_0	83	2	-4	D x N		NS	NS	NS

## FIELD EXPERIMENT HISTORY

**Title: The Ability of Nitrification Inhibitor (SuperU) ratios to Increase Corn Grain Yield in WI Soils.**

**Experiment:** 12Fertilizer **Trial ID:** 5933 **Year:** 2014

**Personnel:** J.G. Lauer, T. Diallo, K.D. Kohn and M. Kazula

**Location:** Marshfield, WI **County:** Wood

**Supported By:** HATCH, WI Fertilizer Research Council, CSCAP

### Site Information

**Field:** ARS008 **Previous Crop:** Corn **Soil Type:** Withee Silt Loam

**Soil Test: Date:** 10/18/2012 **pH:** 6.6 **OM (%)** 3.3 **P (ppm)** 69 **K (ppm)** 145

### Plot Management

**Tillage Operations:** Turbo Till Vertical 2x

<b>Fertilizer:</b>	<u>Analysis</u>	<u>Rate</u>	<u>Date</u>
Preplant	0-0-60	100 lbs/A	5 /6 /14
Starter	N/A	N/A	N/A
Post plant	46-0-0	See Factors	6 /12/14
Manure:	N/A	None	

**Herbicide:** Medal II 1.7 pts/A 6/6/14  
Hornet WDG 3.0 oz/A 6/6/14  
Status 3.0 oz/A 6/6/14

**Insecticide:** N/A

**Irrigation:** None **Hybrid:** See Factors

**Planting Date:** 5/31/14 **Planting Depth:** 1.5" **Row Width:** 30"

**Target Plant Density:** 35000 plants per acre **Planting Method:** John Deere 1700 Planter

**Harvest Date:** 11/17/14 **Harvest Method:** Massey 8XP

**Notes:**

### Experimental Design

**Design:** RCB split-plot with 2x6 Factorial

**Replications:** 4

**Plot Size Seeded:** 25' x 10'

**Experiment Size:** 0.55 A

**Harvest Plot Size:** 5' x 22'

**Harvest Plant Density:** 25893 plants per acre

**Factors/Treatments:**

#### Hybrid

A - (RR) NK N23M-3011A  
B - (SS) DK DKC38-04

#### N Rates and N Source Ratios (SuperU:Urea)

	lb/A	lb/A	
1.	0 (160)	7.	160 100_0
2.	0 (190)	8.	190 0_100
3.	160 0_100	9.	190 25_75
4.	160 25_75	10.	190 50_50
5.	160 50_50	11.	190 75_25
6.	160 75_25	12.	190 100_0

**Results: Table 1412-03 & 1412-04**

**Table: 1412-03. The Ability of Nitrification Inhibitor (SuperU) ratios to Increase Corn Grain Yield in WI Soils. Marshfield, WI - 2014.**

Hybrid	Nitrogen Rate lb/A	SuperU:Urea Ratio %	Grain yield bu/A	Grain moisture %	Test weight lb/bu	Lodged			Harvest density plants/A	*AGI \$/A
						Total %	Stalk %	Root %		
(SS) DKC38-04			110	21.0	50.6	0.4	0.2	0.2	25913	367
(RR) NK N23M-3110A			121	20.4	50.1	0.3	0.2	0.1	25872	403
	0	(160)	56	21.1	53.7	0.2	0.0	0.2	23810	185
	0	(190)	54	21.3	49.4	0.0	0.0	0.0	23958	179
	160	0_100	119	20.6	49.4	0.5	0.3	0.2	28067	396
	160	25_75	122	20.7	50.5	0.7	0.5	0.2	25641	405
	160	50_50	124	20.6	50.3	0.0	0.0	0.0	24651	413
	160	75_25	133	20.6	49.8	0.4	0.0	0.4	26730	445
	160	100_0	122	20.6	50.1	0.6	0.6	0.0	25542	409
	190	0_100	119	20.9	51.1	0.2	0.2	0.0	24948	396
	190	25_75	135	20.7	49.9	0.0	0.0	0.0	27423	452
	190	50_50	137	20.5	49.9	0.7	0.0	0.7	27176	458
	190	75_25	130	20.7	50.4	0.5	0.5	0.0	26235	434
	190	100_0	134	20.5	49.7	0.3	0.3	0.0	26532	447
(SS) DKC38-04	0	(160)	55	21.6	58.6	0.0	0.0	0.0	26928	183
(RR) NK N23M-3110A	0	(190)	55	21.6	49.7	0.0	0.0	0.0	22770	182
(SS) DKC38-04	160	0_100	109	20.8	49.1	0.3	0.3	0.0	27522	363
(SS) DKC38-04	160	25_75	114	21.1	50.4	1.1	0.6	0.4	25344	378
(SS) DKC38-04	160	50_50	119	20.9	49.8	0.0	0.0	0.0	26631	395
(SS) DKC38-04	160	75_25	126	20.8	49.4	0.4	0.0	0.4	25740	419
(SS) DKC38-04	160	100_0	116	20.9	50.0	0.0	0.0	0.0	25641	386
(SS) DKC38-04	190	0_100	118	21.2	51.2	0.3	0.3	0.0	24354	392
(SS) DKC38-04	190	25_75	126	20.8	49.3	0.0	0.0	0.0	27126	421
(SS) DKC38-04	190	50_50	131	20.7	49.8	1.4	0.0	1.4	25146	436
(SS) DKC38-04	190	75_25	123	20.9	50.7	1.0	1.0	0.0	25047	409
(SS) DKC38-04	190	100_0	132	21.0	49.4	0.6	0.6	0.0	28710	441
(RR) NK N23M-3110A	0	(160)	56	20.7	48.9	0.5	0.0	0.5	20691	187
(RR) NK N23M-3110A	0	(190)	53	21.0	49.1	0.0	0.0	0.0	25146	177
(RR) NK N23M-3110A	160	0_100	128	20.3	49.8	0.8	0.3	0.4	28611	429
(RR) NK N23M-3110A	160	25_75	129	20.3	50.7	0.4	0.4	0.0	25938	433
(RR) NK N23M-3110A	160	50_50	129	20.4	50.8	0.0	0.0	0.0	22671	431
(RR) NK N23M-3110A	160	75_25	141	20.4	50.1	0.4	0.0	0.4	27720	472
(RR) NK N23M-3110A	160	100_0	129	20.3	50.1	1.3	1.3	0.0	25443	432
(RR) NK N23M-3110A	190	0_100	120	20.6	51.0	0.0	0.0	0.0	25542	400
(RR) NK N23M-3110A	190	25_75	145	20.5	50.4	0.0	0.0	0.0	27720	483
(RR) NK N23M-3110A	190	50_50	144	20.3	50.1	0.0	0.0	0.0	29205	481
(RR) NK N23M-3110A	190	75_25	137	20.6	50.1	0.0	0.0	0.0	27423	458
(RR) NK N23M-3110A	190	100_0	135	20.0	50.0	0.0	0.0	0.0	24354	453
Mean			115	20.7	50.3	0.4	0.2	0.1	25893	385
<b>Probability(%)</b>										
Hybrid (H)			2.7	0.4	42.9	62.5	73.2	66.2	96.4	2.5
N_Treatment (T)			0.0	0.0	10.0	82.5	66.8	62.2	40.5	0.0
H x T			66.4	48.9	0.7	44.0	54.1	50.3	19.6	67.1
<b>LSD(0.10)</b>										
Hybrid (H)			6	0.2	NS	NS	NS	NS	NS	20
N_Treatment (T)			10	0.3	2.1	NS	NS	NS	NS	33
H x T			NS	NS	3.0	NS	NS	NS	NS	NS

\*AGI: Adjusted Gross Income.

**Table: 1412-04. The Ability of Nitrification Inhibitor (SuperU) ratios to Increase Corn Grain Yield in WI Soils. Greenhouse gases emission - Marshfield, WI 2014.**

DOY	SuperU:Urea Ratio	CO2 flux	N2O flux	CH4 flux	DOY	SuperU:Urea Ratio	CO2 flux	N2O flux	CH4 flux
	%	mg C m <sup>-2</sup> h <sup>-1</sup>	µg N m <sup>-2</sup> h <sup>-1</sup>	µg C m <sup>-2</sup> h <sup>-1</sup>		%	mg C m <sup>-2</sup> h <sup>-1</sup>	µg N m <sup>-2</sup> h <sup>-1</sup>	µg C m <sup>-2</sup> h <sup>-1</sup>
170		51	48	1	270	0 (UTC)	113	8	-20
191		99	102	-1	270	0_100	110	15	-4
239		176	13	-3	270	50_50	113	12	5
256		61	2	1	270	100_0	112	9	-8
270		112	11	-7					
285		51	8	-6	285	0 (UTC)	48	9	-6
					285	0_100	50	7	-10
	0 (UTC)	86	7	-5	285	50_50	52	9	-2
	0_100	90	40	-3	285	100_0	53	7	-7
	50_50	93	43	1					
	100_0	97	32	-3	Mean		92	31	-2
					<b>Probability(%)</b>				
170	0 (UTC)	42	7	-5	DOY (D)		0.0	0.0	36.6
170	0_100	42	53	4	N_treatment (N)		9.7	0.2	37.7
170	50_50	56	99	4	D x N		78.7	0.5	72.4
170	100_0	63	31	0	<b>LSD(0.10)</b>				
					DOY (D)		12	20	NS
191	0 (UTC)	85	15	5	N_treatment (N)		7	16	NS
191	0_100	103	147	-3	D x N		NS	39	NS
191	50_50	106	111	-7					
191	100_0	102	133	1					
239	0 (UTC)	172	4	-7					
239	0_100	168	14	-3					
239	50_50	172	22	3					
239	100_0	191	10	-6					
256	0 (UTC)	59	1	4					
256	0_100	65	2	-1					
256	50_50	56	4	5					
256	100_0	64	2	-2					