On-Farm Comparison Results
ARDC

Nebraska Soybean & Feed Grains Profitability Project

Years:	2006-2008
Title:	Nitrogen Fertilizer Rates & Application Timing
Crop:	Corn
NSFGPP Operator:	ARDC
Private Industry Cooperator:	Mark Schroeder & Walker Luedtke
Objective:	Determine & document the effect of nitrogen fertilizer rates & application timing on the profitability of limited irrigated & irrigated corn in 2006 & fertilizer rate on non-irrigated corn in 2007. In 2008, fertilizer rates & application timing were evaluated on irrigated & non-irrigated corn after soybeans.

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2006 Treatments

Treatments - Irrigated:

30,000 plant population

Full irrigation - 14 inches

1. Split 90 Pre(NH_3) + 37 SD(UAN) = 127 lbs/ac
2. Preplant ENR @ 140 lbs/ac (NH_3)
3. Preplant UNL Rec @ 154 lbs/ac (NH_3)
4. Preplant FARM Rate @ 180 lbs/ac (NH_3)

Treatments - Limited Irrigation:

30,000 plant population.

Limited irrigation - 5.25 inches

1. Side-dress(UAN) @ 64 lbs/ac
2. Preplant ENR @ 78 lbs/ac (NH_3)
3. Preplant UNL Rec @ 86 lbs/ac (NH_3)
4. Preplant FARM Rate @ 120 lbs/ac (NH_3)

SD = Side-dressed

ENR=UNL economical nitrogen rate based on $2.20/bu corn with 235 bu/ac irrigated yield goal & 145 bu/ac limited irrigation yield goal.

2007 Treatments

Treatments - Non-Irrigated Nitrogen Sidedress:

1. 60% Eff Rate (75 lbs/ac)
2. UNL Rec Rate (112 lbs/ac)
3. UNL Econ N Rate (119 lbs/ac)
4. 1.2 lbs @YG-40 (158 lbs/ac)

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2008 Treatments

Treatments - Irrigated:

1. Split 100 Fall (NH_3) + 45 SD(UAN) = 145 lbs/ac
2. UNL Rec @ 145 lbs/ac Fall (NH_3)
3. Farm @ 180 lbs/ac Fall (NH_3)
4. Econ Rate @ 160 lbs/ac Fall (NH_3)

Treatments - Non-Irrigated

1. Side-dress(UAN) @ 77 lbs/ac (UAN)
2. UNL Rec @ 86 lbs/ac Fall (NH_3)
3. Farm @ 120 lbs/ac Fall (NH_3)
4. Econ Rate @ 104 lbs/ac Fall (NH_3)

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Results: 2006 (Pioneer 34A16)

Irrigated — Nitrogen Treatment

	127	140	154	180	Prob>F
Yield, bu/ac @15.5%	209b	213a	210ab	210ab	0.261 ns
Moisture, %	16.0	16.1	16.1	16.1	0.756 ns
Monitor, bu/ac	216	217	217	217	0.991 ns
Cost/ac	$53.70	$49.30	$53.50	$61.20	-----

Planting Date: 4-27-06 Harvest Date:

Results: 2006 (Pioneer 33R79)

Limited Irrigation — Nitrogen Treatment

	64	78	86	120	Prob>F
Yield, bu/ac @15.5%	170	164	164	165	0.533 ns
Moisture, %	17.2	17.5	17.5	17.5	0.291 ns
Monitor, bu/ac	164	160	160	162	0.743 ns
Cost/ac (w/appl cust)	$29.60	$30.80	$33.20	$43.40	-----

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Results: 2007 (Pioneer 33B51)

Non-Irrigated

	Nitrogen, lbs/ac				
	75	112	119	158	Prob>F
Yield, bu/ac @15.5%	154 ***	162 **	164	167	<.0001 ***
Moisture, %	14.6	14.6	14.6	14.6	0.829 ns
Monitor, bu/ac	157 ***	165 *	167	169	0.0001 ***
Cost/ac (nitrogen)	$24.75	$30.96	$39.27	$52.14	
Cost/ac (application@V4)	$7.50	$7.50	$7.50	$7.50	

Plant Population, 23,000 seeds/ac

Planting Date: 4/21/07 Harvest Date: 10/25/07

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Results: 2008 (Pioneer 34R67)

Irrigated

	Nitrogen Treatment				
	145 P/S	145 P	180 P	160 P	Prob>F
Yield, bu/ac @15.5%	200 ab	196 b	203 a	196 b	0.056 *
Moisture, %	15.9	15.9	15.9	15.9	0.841 ns
Monitor, bu/ac	214 ab	210 b	218 a	212 b	0.062 *
Cost/ac (nitrogen)	$56.55	$43.50	$54.00	$48.00	
Cost/ac (application)	$12.50	$7.50	$7.50	$7.50	
Cost/ac (total)	$69.05	$51.00	$61.50	$55.50	

Plant Population, 32,000 seeds/ac

Planting Date: 4/29/08 Harvest Date: 11/06/08

Statistical Analysis (Duncans Multiple Range Test): Values with the same letter are not significantly different of 0.10 probability.

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Results: 2008 (Pioneer 33T56)

Non-Irrigated

	Nitrogen Treatment				
	77 S	86 P	120 P	104 P	Prob>F
Yield, bu/ac @15.5%	158 b	161 b	171 a	168 a	0.0006 ***
Moisture, %	15.3	15.3	15.3	15.3	0.8004 ns
Monitor, bu/ac	159 c	161 c	171 a	167 b	0.0002 ***
Cost/ac (nitrogen)	$45.43	$25.80	$36.00	$31.20	
Cost/ac (application)	$5.00	$7.50	$7.50	$7.50	
Cost/ac (total)	$50.43	$33.30	$43.50	$38.70	

Plant Population, 23,350 seeds/ac

Planting Date: 4/23/08 Harvest Date: 10/20/08

Statistical Analysis (Duncans Multiple Range Test): Values with the same letter are not significantly different of 0.10 probability.

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Summary: In 2006, rate of applied nitrogen had no significant effect on grain yield (weigh wagon or monitor) or grain moisture in either study. NH3 Cost $490/TNH3 application cost included ($7.40/ac) UAN cost $245/T. UAN application cost included ($5/ac). In 2007, increasing the rate of applied nitrogen resulted in an increase in grain yield (weigh wagon or monitor); however, there was no significant difference between the highest rate (158 lbs/ac) & the UNL Economic N Rate (119 lbs/ac). Grain moisture at harvest was not affected by rate of applied nitrogen. In 2008, grain yield was highest with the highest rate of applied nitrogen in both studies. Splitting the application also resulted in maximum yield in the irrigated study. Grain moisture at harvest was not affected by nitrogen treatment. Results are the same using weigh wagon or monitor.