

NEBRASKA ON-FARM RESEARCH NETWORK



2014 GROWING SEASON RESULTS

Post-Conference Publication March 2015

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NEBRASKA ON-FARM RESEARCH NETWORK

2014 GROWING SEASON RESULTS

February 13

Hall County Extension Office located College Park Campus * Grand Island, Nebraska

February 16

Lifelong Learning Center Northeast Community College * Norfolk, Nebraska

February 17

University of Nebraska Agricultural Research and Development Center * near Mead, Nebraska

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NEBRASKA ON-FARM RESEARCH NETWORK

In production ag it's what you think you know, that you really don't know, that can hurt you.

Why On-Farm Research?

On-farm research has many variants and approaches. It is research that you do on your field(s) using your equipment and normal production practices. This means the research is directly applicable to your operation. The Nebraska On-Farm Research Network approaches topics that are critical farmer production, profitability and natural resources questions, such as:

- Nutrient management
- Pest control
- Irrigation Strategies
- Conservation programs
- New technologies
- Soil amendments
- Cultural practices
- Hybrid and variety selection

About the Research

- Comparisons are identified and designed to answer producers' production questions.
- Projects protocols are developed first and foremost to meet individual cooperator needs.
- Only projects that are randomized, replicated and harvested accordingly are reported.
- Multiple year comparisons are encouraged.

Statistics 101

Replication: In statistics, replication is repetition of an experiment or observation in the same or similar conditions. Replication is important because it adds information about the reliability of the conclusions or estimates to be drawn from the data. The statistical methods that assess that reliability rely on replication.

Randomization: Using random sampling as a method of selecting a sample from a population in which all the items in the population have an equal chance of being chosen in the sample. Randomization reduces the introduction of bias into the analysis.

What is the P-value? The P-Value reported for each study is the calculated probability that the differences found in the study are due to chance. As the P-Value number gets smaller, the probability increases that there are real differences. This helps differentiate between random variation and real treatment effects. For these studies we use a P-Value of 0.1 as the cutoff to determine whether the treatment differences are greater than random variation (sometimes called experimental error). When the differences are thought to be real we call them significant. If the P-Value is less than 0.1 we know that there is 10% or less chance that the yield differences are due to random variation. If this is the case, the letters following yield figures are different to show the statistical difference. As the P-Value increases the differences are more and more likely due to chance. In this book treatment data that is not different (P-Values are greater than 0.1) are followed by the same letter. We have chosen 0.1 as the point where we are confident that our yield differences are due to the treatments and not other factors, however this is an arbitrary cut-off. In cases where it does not cost anything to switch treatments, such as when varieties cost the same, a different cut-off level could be chosen.

Paired comparison design

	PAIR 1	PAIR 2	PAIR 3	PAIR 4	PAIR 5	PAIR 6	PAIR 7	
Trt	A	B	A	B	A	B	A	B

Randomized complete block design

	Block 1	Block 2	Block 3	Block 4
Treatment A	Treatment A	Treatment A	Treatment A	Treatment A
Treatment B	Treatment B	Treatment B	Treatment B	Treatment B
Treatment C	Treatment C	Treatment C	Treatment C	Treatment C
Treatment D	Treatment D	Treatment D	Treatment D	Treatment D

Rainfall Data

Rainfall data is provided for each study based on the field location. The rainfall graphs are developed using data from National Weather Service radar and ground stations that are 2 km accurate.

<https://farmlogs.com/>



Profit Calculation

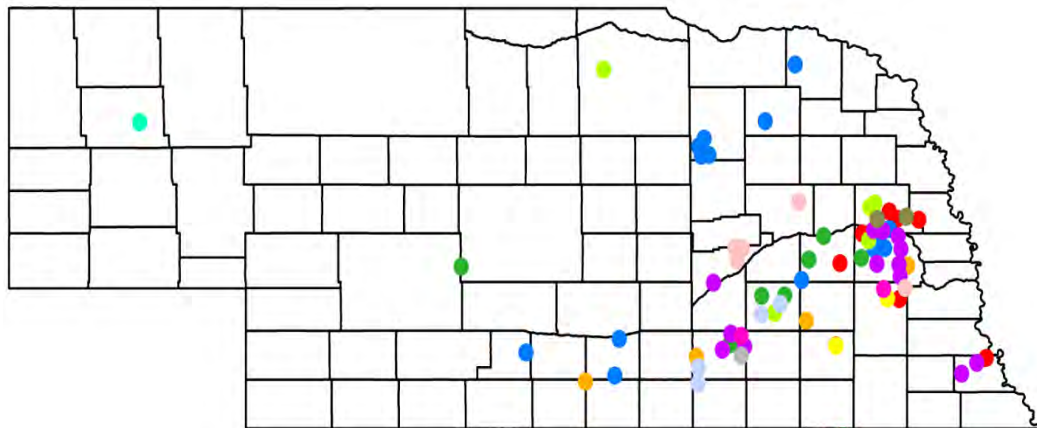
Many of our studies include a net return calculation. It is difficult to make this figure applicable to every producer. In order to calculate revenue for our research plots we use input costs provided by the producer, application costs from Nebraska Extensions 2014 Nebraska Farm Custom Rates – Part 1 and 2 (EC823 and EC826), and an average commodity market price for 2014.

Average market commodity prices for the 2014 report are:

- Corn: \$3.50/bu
- Soybeans: \$10.00/bu
- Wheat: \$6.00/bu
- Sorghum: \$3.50/bu
- Dry Edible Beans: \$30/cwt (\$18/bu @ 60lb/bu)
- Popcorn: \$0.19/lb

In order to make this information relevant to your operation, you may need to refigure return per acre with costs that you expect.

2014 Study Locations

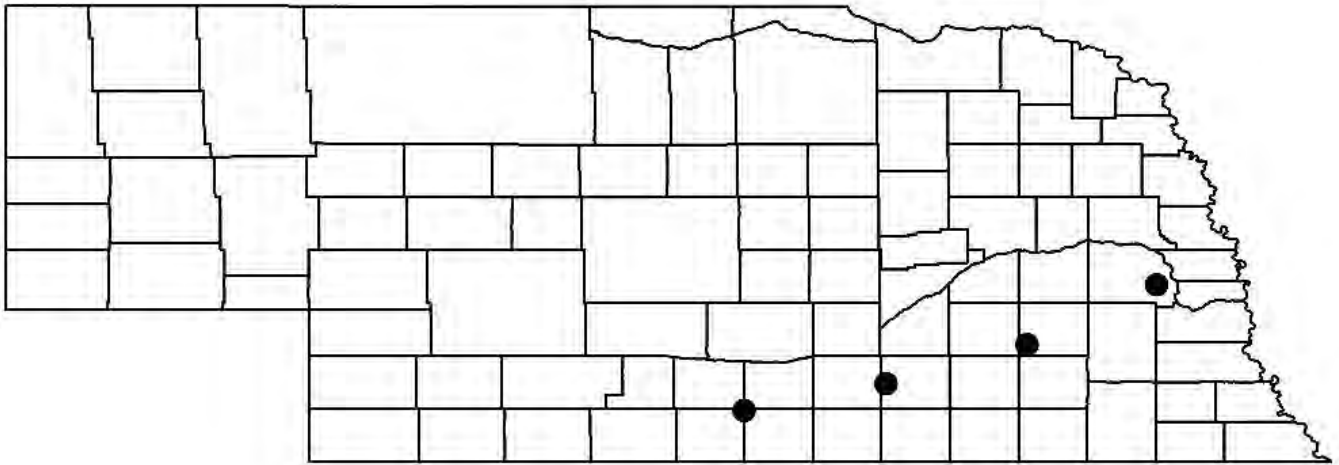


2014 Study Topics

- Corn Population Studies
- Cover Crops
- Foliar Micronutrient Studies
- Other Nutrient Studies
- Sugar Studies
- Fungicide Studies
- Growth Promoters
- Harvest Methods in Dry Edible Beans
- Insect Control Traits
- Lime
- Planting Operation Studies
- Polymer
- Seed Treatments
- Soybean Population Studies

Cover Crops Studies

Cover Crop Study Locations:



Corn Planted into Summer Cover Crop Mix

Study ID: 038035201401

County: Clay

Soil Type: Hastings Silt Loam

Planting Date: 5/6/2014

Harvest Date: 11/5/2014

Population: 27,500 seeds/acre

Row Spacing: 30"

Hybrid: DKC 60-67

Reps: 6

Previous Crop: Wheat

Tillage: No-till

Herbicides: Pre: None

Post: 1 qt. Roundup PowerMAX

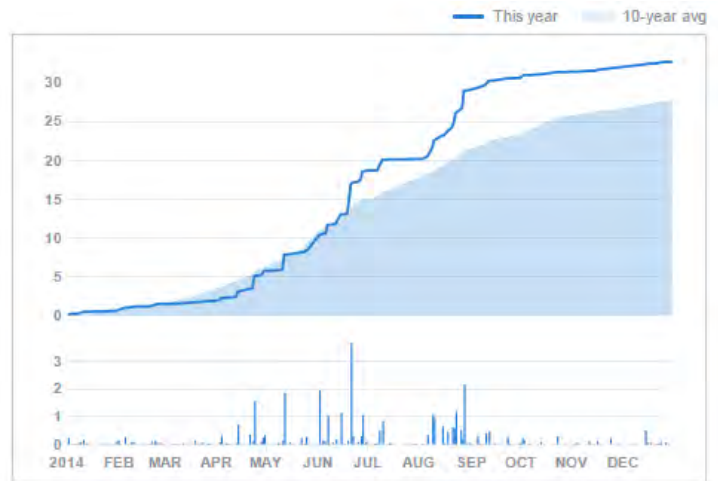
1 qt. TripleFLEX on 5/30/14

Insecticides/Fungicides: Acceleron Seed treatment

Fertilizer: 150 lbs 46-0-0, 3 lb Zn, 10 lb Sulfur, 6 gal 10-34-0

Irrigation: None

Rainfall:



Introduction: This study is looking at the effects of a cover crop on the subsequent cash crop. The cover crop used in this study was a summer cover crop mix including winter pea, mung bean, sorghum x sudangrass, pearl millet, oats, nitro radish, and sunflower. It was seeded at 36#/acre into wheat stubble on August 3, 2013 and was winter killed. Corn was planted into residue in 2014. The cover crop treatment is compared to planting into wheat stubble with no cover crop. Figure 1 shows strips of cover crop mix and no cover crop.

Figure 1 shows strips of cover crop mix and no cover crop. Figure 1 shows strips of cover crop mix and no cover crop.



Figure 1: Strips of summer cover crop mix and no cover crop (wheat stubble remaining) on November 18, 2013.

Results:

	Yield [†] (bu/acre)	Moisture (%)	Test Weight (lb/bu)	Harvest Pop	Net Return [‡]
No Cover Crop	178 A*	14.4% A	62.3 A	26,667 B	\$623
Cover Crop	173 B	14.1% A	63.3 A	27,833 A	\$572.50
P-Value	0.0953	0.1113	0.4045	0.0842	--

[†]Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

[‡]Net return based on \$3.50/bu corn, \$26/acre cover crop, and \$7/acre drill rental cost.

Summary: This year, the cover crop mixture resulted in lower yields for the following corn crop. There was no difference in moisture or test weight for either treatment. The yield reduction and cost of cover crop resulted in a loss of \$50.50/acre.

Corn Planted into Rye Cover Crop

Study ID: 006159201401

County: Seward

Soil Type: Hastings silty clay loam, Crete, Muir, Butler, and Coly-Hobbs silt loams

Planting Date: 4/22/2014

Harvest Date: 11/5/2014

Population: 34,000

Row Spacing: 30"

Hybrid: BigCob B14-84GT

Reps: 6

Previous Crop: Soybeans

Tillage: No-till

Herbicides: Pre: Balance Flex 5oz + Atrazine 1qt + Roundup PowerMAX 22oz -4/4/14

Post: Durango 32oz + Impact 1/2oz + Outlook 10oz 6/12/14

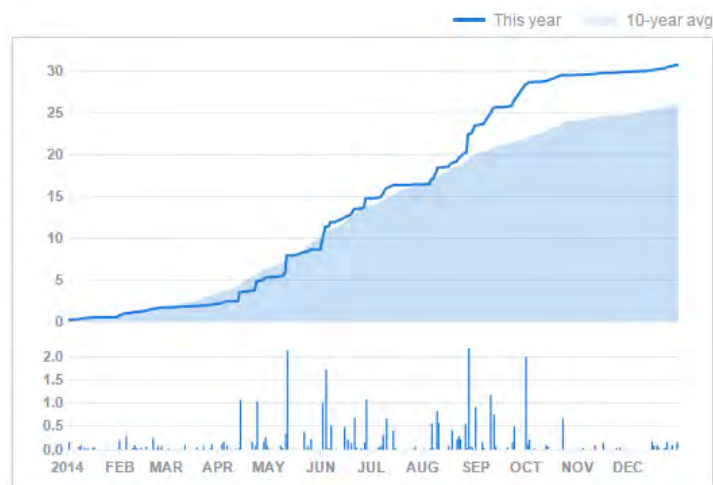
Insecticides/Fungicides: standard seed treatment

Fertilizer: 156 lbs 46-0-0, 3 lb Zn, 10 lb Sulfur, 6 gal 10-34-0

Note: May 11 tornado, May 26 hail.

Irrigation: Pivot

Rainfall:



Introduction: This study is looking at the effects of a cereal rye cover crop on the subsequent corn grain yield. The cereal rye was drilled at 40 lb/acre into soybean stubble on October 10, 2013 and was terminated with Balance Flex (5 oz/ac), Atrazine (1 qt/ac), and Roundup PowerMAX (22 oz/acre) on April 4, 2014. This herbicide program is the same that the grower used on all fields, so there was no additional cost for cover crop termination. Rye was 6-12" at termination. Corn was planted into the soybean stubble and cereal rye residue on April 22, 2014. The cover crop treatment is compared to planting into soybean stubble with no cover crop.



Results:

	Yield† (bu/acre)	Net Return‡
Check	248 A	\$866.74
Rye	247 A	\$841.07
P-Value	0.2919	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu. corn, \$10.80/acre rye cover crop, and \$13.37/acre drill application cost (no additional cost for Rye termination since herbicide program was the same as what the grower normally used for a pre-emerge burndown).

Summary: There was no grain yield difference between the corn planted into the cereal rye residue and corn planted into soybean stubble. However, calculated net return was approximately \$26/acre less for the cereal rye cover crop.

Soybeans Planted into Grazed and Non-grazed Cover Crop

Study ID: 025155201401

County: Saunders

Soil Type: Yutan silty clay loam and Filbert and Tomek silt loam

Planting Date: 4/26/2014

Harvest Date: unknown

Population: 140,000

Row Spacing: 7.5"

Hybrid: NuPride 8261R

Reps: 3

Previous Crop: Wheat (Prior long term Corn/Soy)

Tillage: No-till

Insecticides/Fungicides: Leverage 360 2.8oz, StrategoYLD 4oz, R3 growth stage

Herbicides: Pre: Prowl 3pt, Enlite 2.8oz, 2,4-D 8oz, Roundup PowerMax 22oz, AMS 3#, 4/18/14

Post: 22 oz Roundup PowerMax, 8 oz SelectMax.

Irrigation: Pivot – 5 turns with 1.25" per turn. Total: 6.25"



Introduction: This study looked at the effects of a cover crop following wheat on the subsequent soybean yield. This study included three treatment: soybeans planted into wheat (check), soybeans planted following cover crop, and soybeans planted following a grazed cover crop. The cover crop used in this study was a mix of clover (1 lb/acre), sordan 79 (1 lb/acre), oats (15 lb/acre), purple top turnips (2 lb/acre), and sunflower (2 lb/acre). It was seeded at 21#/acre into wheat stubble on August 19, 2013 and was winter killed. For the grazed treatment, cattle (1hd/acre) began grazing on November 12, 2013 and completed grazing on December 30, 2013 for a total of 48 days of grazing. Overall, ADG was 2.03 with total gain of 97 lbs/acre. Forage production was 1.08 tons/ac (dry matter). Soybeans were planted into all three treatments on April 26, 2014. Soybeans were replanted on May 21, 2014 due to 50% stand reduction (prior to replant the remaining first stand of soybeans was killed with Aim). Grain yield of soybeans planted into wheat stubble (check) and planted into grazed and non-grazed cover crop were compared in this study.

Results:

	Yield† (bu/acre)	Net Return ‡
Check	64 A*	\$643.80
CoverCrop	64 A	\$601.73
Grazed Cover Crop	62 A	\$765.53
P-Value	0.4700	--

†Bushels per acre corrected to 13% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$10.00/bu. soybeans, \$22/acre cover crop seed cost, and \$13.37/acre drill application cost. Calf price in 2013 was \$188.50 for 500-600 lb calves and \$189.90 in December. With calves gaining 97 lb, there was a gain of \$191 per calf (also \$191 per acre). With cost of fencing and labor to provide water and check cattle at \$12.50/calf the net income for the calves would be \$178.50.)

Summary: There was no significant difference in yield of the soybeans planted into wheat stubble (check) and planted into grazed and non-grazed cover crop. With the additional income for the cattle, the grazed cover crop treatment was most profitable.

Wheat Planted Into Soil Builder Cover Crop

Study ID: 023137201401

County: Phelps

Soil Type: Holdrege silt loam

Planting Date: 10/4/2013

Harvest Date: unknown

Population: 987,780

Row Spacing: 7.5"

Hybrid: Settler

Reps: 4

Previous Crop: Corn

Tillage: No-till

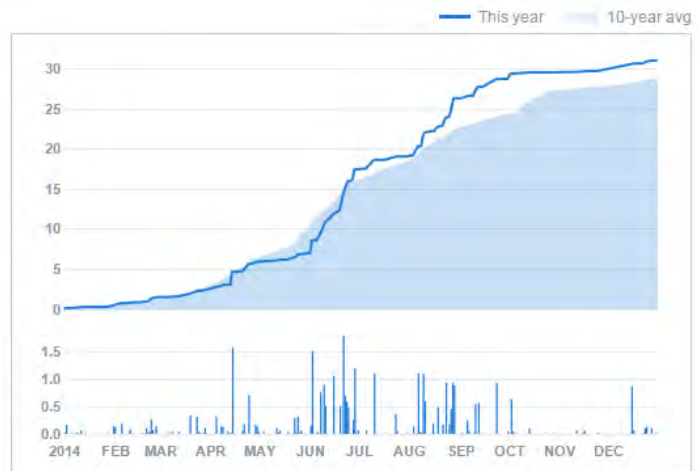
Herbicides: Unknown

Insecticides/Fungicides: Unknown

Fertilizer: UAN 32% 60lbs – November 2013,
UAN 32% 20lbs March 2014

Irrigation: Not irrigated

Rainfall:



Introduction: This study is looking at the effects of a cover crop on the subsequent cash crop. The cover crop used in this study was “Soil Builder Cover Crop Mix”. This mix consisted of reeves oats (52%), spring triticale (21%), common vetch (13%), ed annual ryegrass (6%) flax (6%) and de rapeseed (2%). It was seeded at 25 lbs/ac into corn stubble in the spring of 2013. The cover crop was terminated August 2013 using 80 oz/ac Glystar Plus and 8.25 oz/ac Clarifier. Wheat was planted into the residue in September 2013. The cover crop treatment is compared to planting into corn stubble with no cover crop.

Results:

	Yield [†] (bu/acre)	Moisture (%)	Net Return [‡]
Check	68 A*	12.6 B	\$406.11
Cover Crop	48 B	13.3 A	\$232.52
P-Value	<0.0001	0.0922	--

[†]Bushels per acre corrected to 14% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

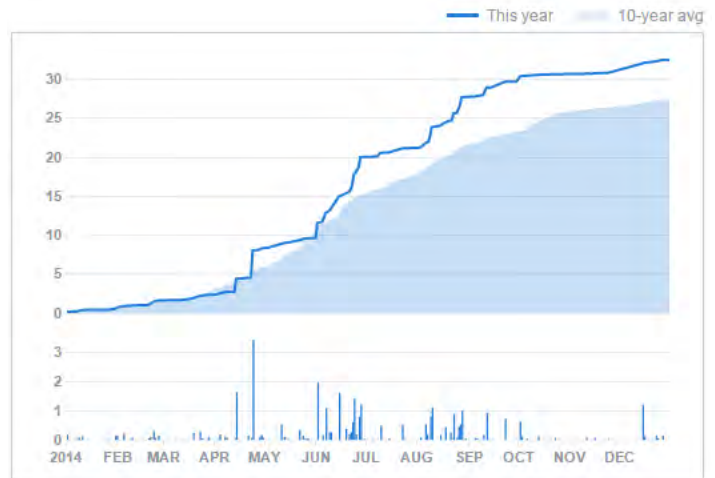
[‡] Net return based on \$6.00/bu wheat, \$25/acre cover crop, \$13.37/acre drill application cost, and approximately \$19.51 for cover crop termination (herbicide and spray application).

Summary: The wheat planted into cover crop treatment resulted in yields that were 20 bu/acre less than check yields and were higher in moisture. Overall, the cover crop treatment resulted in a loss of \$173.59/ac.

Corn Planted Into Cover Crop Mix

Study ID: 041061201401
County: Franklin
Soil Type: Holdredge – Silt Loam
Planting Date: 5/4/2014
Harvest Date: Unknown
Population: 23,000
Row Spacing: 30”
Hybrid: Pioneer 1498
Reps: 12
Previous Crop: Wheat
Tillage: No-till
Herbicides: Unknown
Insecticides/Fungicides: Unknown
Fertilizer: UAN 32% 15lbs 2x2 – 5/4/14, UAN 32% 100lbs – 5/8/14

Irrigation: None
Rainfall:



Introduction: This study is looking at the effects of a cover crop on the subsequent cash crop. The cover crop used in this study was a mix of sorghum - 4%, sorghum X sudangrass - 4%, forage rape seed - 4%, tilth pro or jackhammer tillage radish- 4%, purple top turnip- 4%, forage pea- 59.1%, hairy vetch- 18.2%. It was seeded at 22#/acre into wheat stubble in August 2013 and was winter killed. Corn was planted into residue in 2014. The cover crop treatment was compared to planting into wheat stubble without a cover crop. Soil moisture was also compared for fall 2013, spring 2014, and fall 2014.



Figure 1: Cover crop versus no-cover crop treatment.

Results:

	Yield† (bu/acre)	Moisture (%)	Soil Moisture			Net Return ‡
			Fall 2013	Spring 2014	Fall 2014	
			-----inches-----			
Check	158 A*	14.5 A	8.2 A	10.7 A	9.1 A	\$554.16
Cover Crop	148 B	14.3 B	7.3 A	9.3 B	9.5 A	\$476.48
P-Value	<0.0001	0.0180	0.1182	0.0379	0.7277	--

†Bushels per acre corrected to 15.5% moisture.

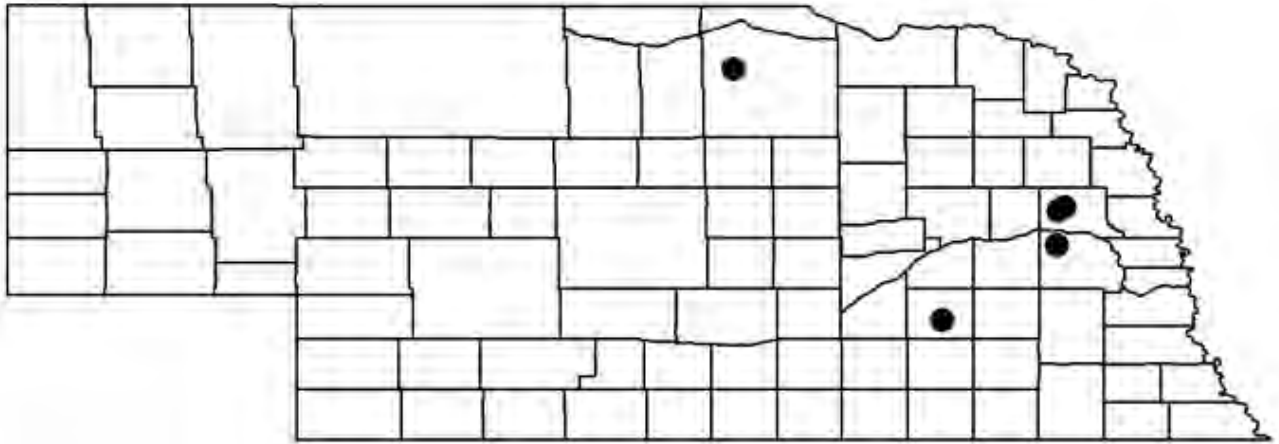
*Values with the same letter are not significantly different at a 90% confidence level.

‡ Net return based on \$3.50/bu. corn, \$27.28/acre cover crop, and \$13.37/acre drill application cost.

Summary: The corn planted into the wheat stubble without a cover crop had greater yield and higher grain moisture than the corn following the cover crop. Yield monitor values are shown here, however the yield monitor needed to be recalibrated and actual field yields were approximately 20 bu/ac higher. There was no difference in soil moisture between the check and cover crop in fall of 2013 or 2014; however in spring of 2014 the check had higher soil moisture than the cover crop treatment.

Fungicides Studies

Fungicide Study Locations:



Rainfed Corn Yield Response to an In-Furrow Fungicide Application

Study ID: 039053201402

County: Dodge

Soil Type: Belfore and Zook silty clay loam;
Nora and Judson silt loam.

Planting Date: 4/28/2014

Harvest Date: 11/3/2014

Population: 30,000

Row Spacing: 30"

Hybrid: GH14R38

Reps: 20

Previous Crop: Soybeans

Tillage: No-Till

Herbicides: Pre: Lexar EZ 2qt +Roundup

PowerMAX 22oz 5/13/14 **Post:** Armezon

0.6oz + RoundupProMax - 6/10/14

Insecticides/Fungicides: Avicta Complete

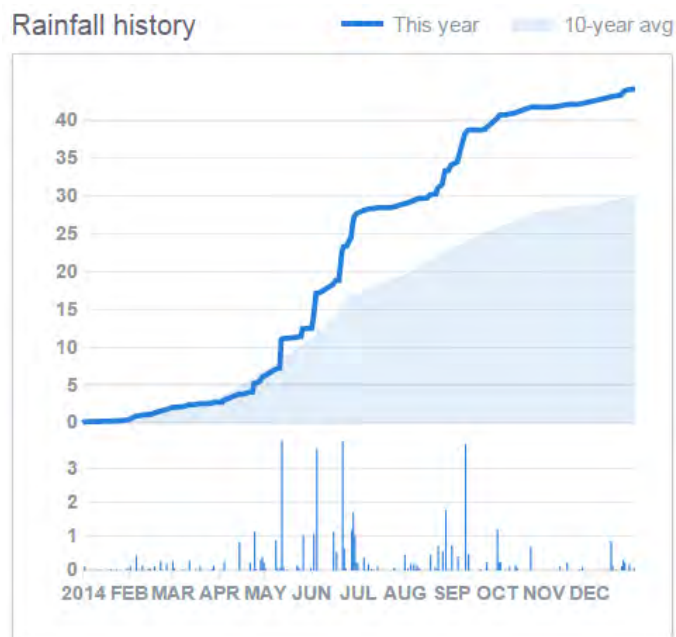
Corn, Baythroid –XL – 6/26/14, Priaxor 4oz -

6/26/14, Headline AMP 10oz - 8/1/14

Fertilizer: NH3 160lbs fall 2013

Irrigation: Not Irrigated

Rainfall history



Introduction: The purpose of this study was to determine if an in-furrow application of a fungicide resulted in an increase in corn grain yield. Headline® EC at a 3 oz/acre rate was used in this fungicide study.

Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Check	213 A*	18.8 A	\$743.75
Headline® EC	212 A	18.9 A	\$733.86
P-Value	0.8385	0.9005	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn and \$8.42/ac Headline® EC.

Summary: The application of Headline® EC in-furrow did not result in a significant yield or moisture difference when compared to the check.

Rainfed Corn Yield Response to an In-Furrow Fungicide Application

Study ID: 039053201401

County: Dodge

Soil Type: Belfore, Zook, Nora, and Judson silty clay loams.

Planting Date: 4/28/2014

Harvest Date: 11/3/2014

Population: 30,000

Row Spacing: 30"

Hybrid: GH14R38

Reps: 20

Previous Crop: Soybeans

Tillage: No-Till

Herbicides: Pre: Lexar EZ 2qt +Roundup

PowerMAX 22oz 5/13/14 **Post:** Armezon

0.6oz + RoundupProMax - 6/10/14

Insecticides/Fungicides: Avicta Complete

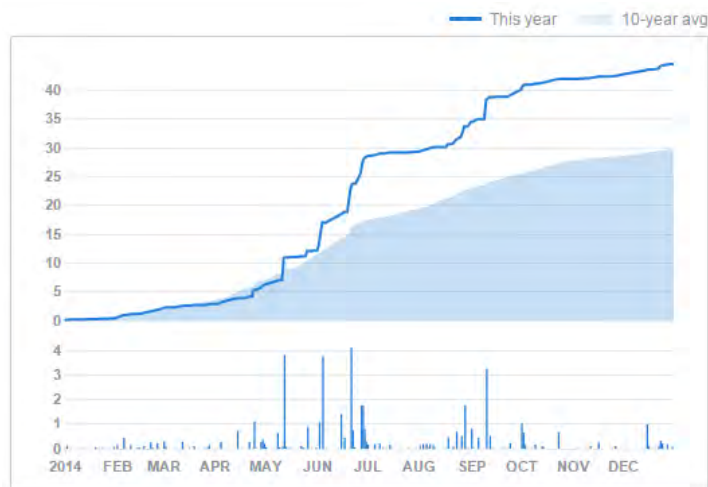
Corn, Baythroid –XL – 6/26/14, Priaxor 4oz -

6/26/14, Headline AMP 10oz - 8/14/14

Fertilizer: 160lbs NH3 – Fall 2013

Irrigated: Not irrigated.

Rainfall:



Introduction: The purpose of this study was to determine if an in-furrow application of a fungicide resulted in an increase in corn grain yield. Headline® EC at a 3 oz/acre rate was used in this fungicide study.

Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Check	193 B*	17.8 A	\$675.61
Headline® EC	195 A	17.7 B	\$674.01
P-Value	0.0589	0.0460	

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn and \$8.42/ac Headline® EC.

Summary: The application of Headline® EC in-furrow resulted in significantly higher yield and significantly lower grain moisture when compared to the check.

Combined In-Furrow Fungicide Analysis

Two studies looked at the effects of Headline® EC fungicide applied in-furrow on corn following soybeans. The product was applied at a 3 oz/acre rate. Both sites were no-till, 30" row spacing, and rainfed sites located in eastern Nebraska.

Results:

A total of 40 replications were used in this combined analysis. There was no site by treatment interaction and no treatment effect on yield, however there was a significant site effect (Table 1). Therefore means for yield and moisture for the site main effect are shown in Table 2.

Table 1. P-values for site and treatment main effects and site by treatment interaction on yield.

Effect	Pr>F
Site	<0.0001
Treatment	0.4979
Site*Treatment	0.2973

Table 2. Means for yield and moisture for each site across fungicide treatment.

Site number (corresponds to study number)	Yield† (bu/acre)	Moisture (%)
Site 1: 039053201402	212 A	18.9 A
Site 2: 039053201401	194 B	17.7 B

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

Summary: The two sites had different yields and grain moisture. The application of Headline® EC in-furrow did not result in a significant yield or moisture difference when compared to the check at either site. Averaged across both sites, the difference between the check and headline was 0.76 bu/acre with the Headline® EC treatment yielding more than the check, however this was not a statistically significant difference at the 90% confidence level.

Fungicide on Corn

Study ID: 006159201402

County: Seward

Soil Type: Hastings silt loam – silty clay loam

Planting Date: 4/22/2014

Harvest Date: 11/12/2014

Population: 34,000

Row Spacing: 30"

Hybrid: BigCob B06-47GT

Reps: 6

Previous Crop: Soybeans

Tillage: No-Till

Herbicides: Pre: Balance Flexx 5oz + Atrazine 4 L 1qt + RoundupPowerMAX 22oz – 4/28/14

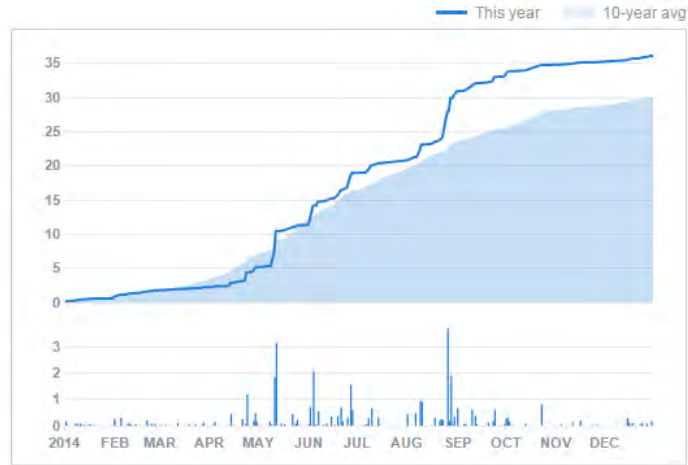
Post: Durango 32oz + Impact ½oz + Zidua 2oz – 6/11/14

Insecticides/Fungicides: none

Fertilizer: 180lbs NH₃, 10lbs 60% K, 15lbs 36% Zinc, 30lbs Sulfur – Spring, 80lbs MAP mid-March,

Irrigation: Pivot

Rainfall:



Introduction: This study is looking at the effects of applying a fungicide following a 6/3/14 hail storm. The fungicide QuiltXcel® was applied at the rate of 10.5 oz. on 6/11/14 and compared to treatments with no fungicide applied. The corn was in the V7-8 at the time of the fungicide application.

Results:

	Yield† (bu/acre)	Pinch Test (% of stalks that crushed)	Harvest Pop (plants/ac)	Net Return ‡
Check	147 A*	11.3 A	23,250 A	\$513.14
Fungicide	143 A	7.5 A	24,250 A	\$487.11
P-Value	0.3698	0.3189	0.7132	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50 corn and \$15 fungicide cost.

Summary: There was no significant yield, pinch test, or harvest population difference between the check and fungicide treated corn.

Fungicide Applications for Goss's Wilt in Popcorn

Study ID: 005089201401

County: Holt

Soil Type: Boelus loamy sand

Planting Date: 5/10/2014

Harvest Date: 10/25/2014

Population: Unknown

Row Spacing: Unknown

Hybrid: WL310

Reps: 4

Previous Crop: Dry beans

Tillage: Tilled

Herbicides: Pre: Unknown

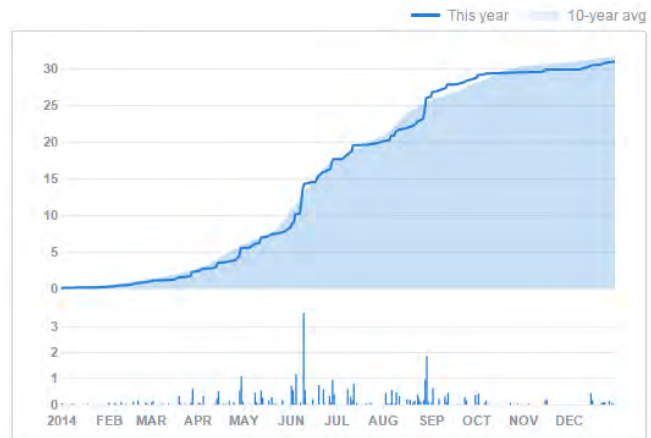
Post: Unknown

Insecticides/Fungicides: Unknown

Note: Hailed on June 3, 2014

Irrigation: Center pivot

Rainfall:



Introduction: After Goss's Bacterial Wilt was found in this popcorn field, the producer decided to test four products for their ability to decrease disease severity and increase yields. Application was with ground rig at tassel on July 23, 2014 at 15 gal/acre.

The four products evaluated were:

EcoAgra™ 300 (a bio-based product) at 5.1 fl oz/acre

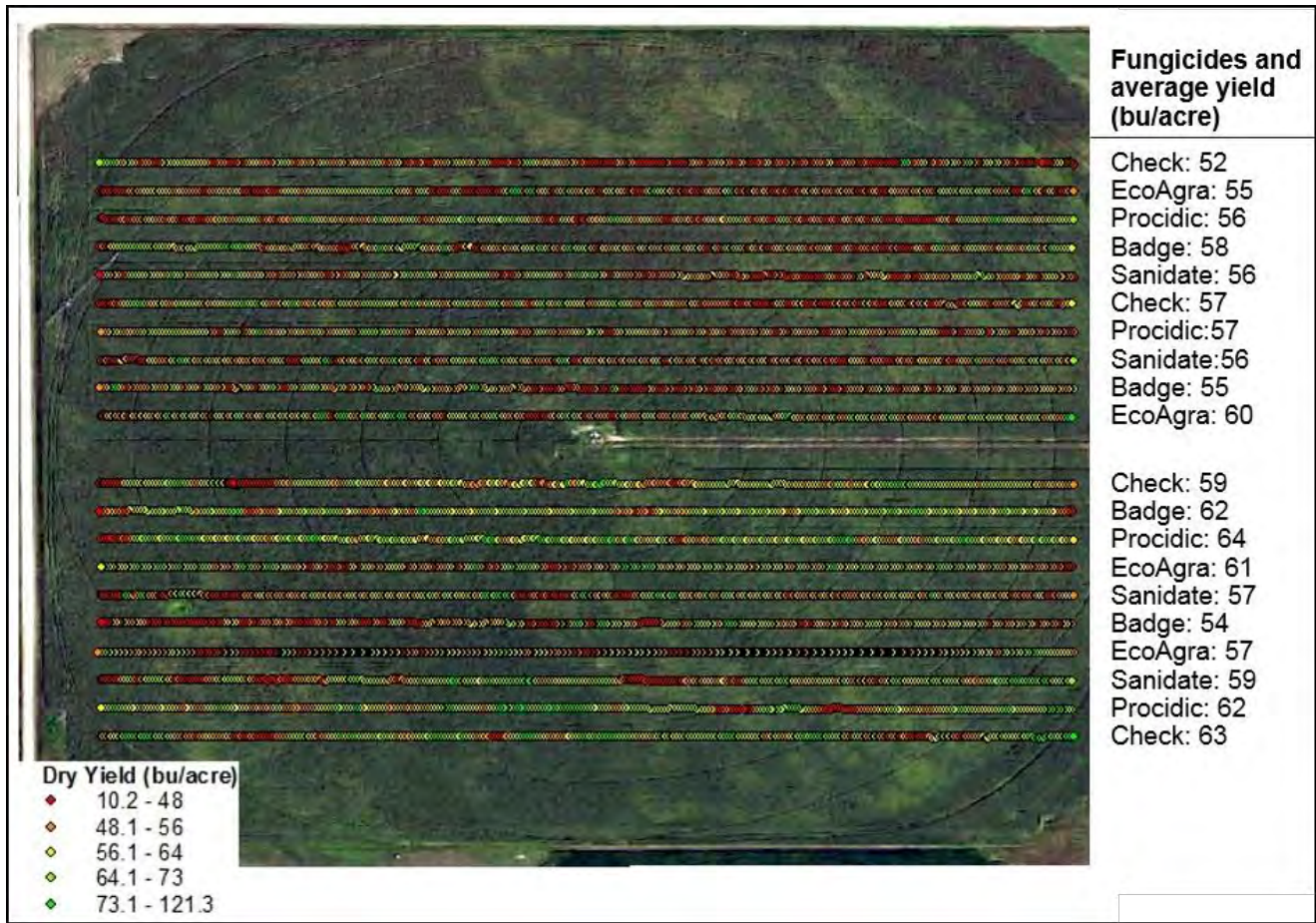
Procidic® (3.5% citric acid and 96.5% other ingredients) at 14 fl oz/acre

Badge® SC (16.81% copper oxychloride and 15.36% copper hydroxide) at 1 pt/acre

Sanidate® (23% hydrogen peroxide and 5.3% peroxyacetic acid) at 1:1000 dilution/acre

It should be noted that several of these products recommend applications at different times or different frequencies than what was used in this study. In this study, only one application of each product was made at the time of tassel.

Results:



	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Check	58 A*	17.1 A	\$617.12
EcoAgra™	58 A	18.1 A	\$604.44
Procidic®	60 A	17.1 A	\$629.09
Badge® SC	57 A	16.8 A	\$595.42
Sanidate®	57 A	16.8 A	\$604.44
<i>P-Value</i>	0.7186	0.2660	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$0.19/lb for popcorn, \$7.50/ac Sanidate®, \$4.25/acre Badge®, \$2.50/ac Procidic™, \$5.87/ac EcoAgra™ 300, and \$6.81 application cost.

Summary: There was no significant difference in popcorn yield for any of the products tested. Further research should include evaluating the same products from this study, but adjusting to use the application timing and frequency that was recommended for each product.

Fungicide and Insecticide Application at R3 on Soybeans

Study ID: 007155201402

County: Saunders

Soil Type: Yutan – silty clay loam

Planting Date: 5/11/2014

Harvest Date: 10/17/2014

Population: 140,000

Row Spacing: 15"

Hybrid: Channel 2607R2

Reps: 6

Previous Crop: Corn

Tillage: No-Till

Herbicides: Pre: Valor XLT 3oz + 2, 4-D LV6

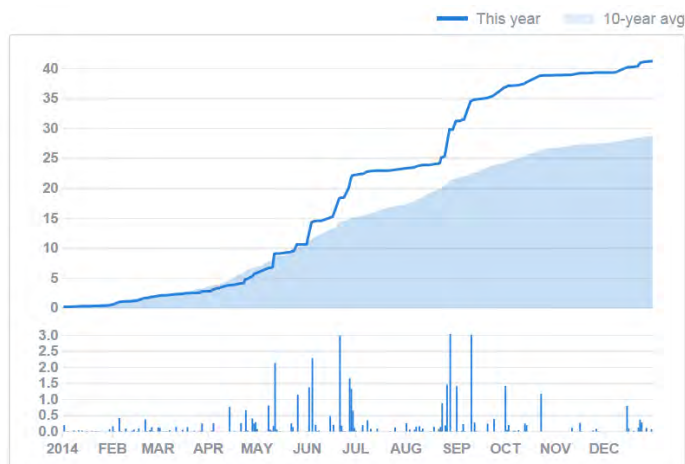
1/3pt Buccaneer Plus 24oz – April 15

Post: Buccaneer Plus 48oz – June 15.

Fertilizer: MAP 110lbs – winter 2013

Irrigated: Not irrigated.

Rainfall:



Soil Test Values:

	pH	BpH	OM ---%---	P Mehlich III -----ppm-----	K	S	Zn
Average	5.7	6.6	2.3	13.7	290.2	24	0.6

Introduction: The purpose of this study was to determine if additions of fungicide and insecticide applied at R3 improved soybean yields and subsequent profitability. Products used in the treated application include Stratego®YLD fungicide at 4 oz/ac and two generic insecticides. Active ingredients for the insecticides are Chlorpyrifos at 0.5 pt/ac and Lambda-Cyhalothrin at 1.25 oz/ac.

Results:

	Yield† (bu/acre)	Net Return ‡
Check	62 A*	\$620.85
Fungicide and Insecticide	63 A	\$609.63
P-Value	0.4274	--

†Bushels per acre corrected to 13% moisture.

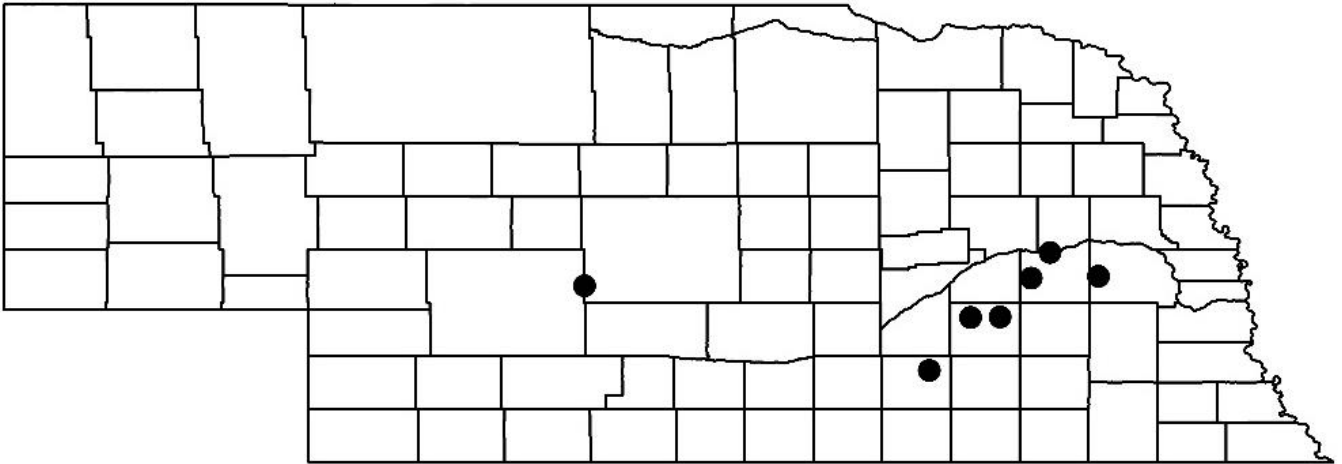
*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$10.00 soybeans and \$16.23 treatment cost.

Summary: There was no yield difference between the check and fungicide and insecticide treated soybeans.

Growth Promoters Studies

Growth Promoter Locations:



Ascend® Growth Regulator on Corn

Study ID: 008041201401

County: Custer

Soil Type: Hall silt loam

Planting Date: 5/3/2014

Harvest Date: 11/5/2014

Population: 34,500

Row Spacing: 36"

Hybrid: Pioneer 1151AMX

Reps: 8

Soil Test Values: not available

Previous Crop: Corn

Tillage: Strip till

Herbicides: Pre: Banvel

Post: Guardsman Max,
Glyphosate

Fertilizers: Strip till fertilizer 58 lb/ac N, 40 lb/ac P, 8.5 lb/ac S, 0.5 lb/ac Zn, 2"x2" 41 lb/ac of N, 3 lb/ac of S, in seed furrow 5 lb/ac of N, 18 lb/ac of P, and 0.25 lb/ac Zn, 92 lb/ac N, 10 lb/ac S, side dress 10" off row, 3" down.

Introduction: This study is looking at the effects of a growth promoter product applied at planting time on yield. The growth regulator Ascend® was applied at planting time at the rate of 6 fl oz/ac. The field was the second year of corn in a corn/corn/soybean rotation and was planted with strip-till planting methods. The Ascend® treatment was compared to planting without a growth promoter treatment. Product label and ingredients are at right.

Results:

	Yield† (bu/acre)	Net Return ‡
Check	154 A*	\$539.00
Ascend®	155 A	\$531.00
P-Value	0.2436	--

†Bushels per acre corrected to 15.5% moisture.

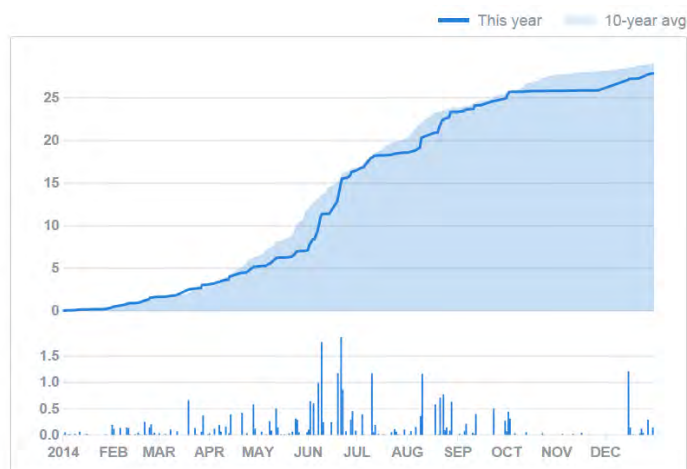
*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn price and \$11.40/ac treatment cost.

Note: Hail damage with 30% defoliation at 17 leaf stage with some lodging; 30% additional defoliation with stalk bruising at blister stage.

Irrigation: Pivot

Rainfall:



ASCEND®

PLANT GROWTH REGULATOR

*Hormone compounds to stimulate plant growth.
Concentrations based on biological activity.*

ACTIVE INGREDIENTS	
*Cytokinin, as Kinetin	0.090%
*Gibberellic Acid	0.030%
*Indole Butyric Acid	0.045%
OTHER INGREDIENTS	99.835%
TOTAL	100.000%

*Contains 0.03 oz. cytokinins/qt.
*Contains 0.015 oz. indole butyric acid/qt.
*Contains 0.01 oz. gibberellic acid/qt.

Summary: The Ascend® treatment did not result in a significant yield increase. Net returns for Ascend® treated corn were lower due to increased cost of production which were not recovered.

RyzUp Smartgrass® Growth Regulator on Corn

Study ID: 026185201402

County: York

Soil Type: Hastings silt loam

Planting Date: 4/23/2014

Harvest Date: 10/25/2014

Population: 34,000

Row Spacing: 30"

Hybrid: Pioneer 1690

Reps: 8

Soil Test Values: Not Available

Previous Crop: Corn

Tillage: Ridge till

Herbicides:

Pre: 2.1 qt/ac Bicep II Magnum FC of Bicep II Magnum on 4/23/2014

Post: 32 oz/ac Glyphosate with 1 lb/ac sugar on 6/10/2014

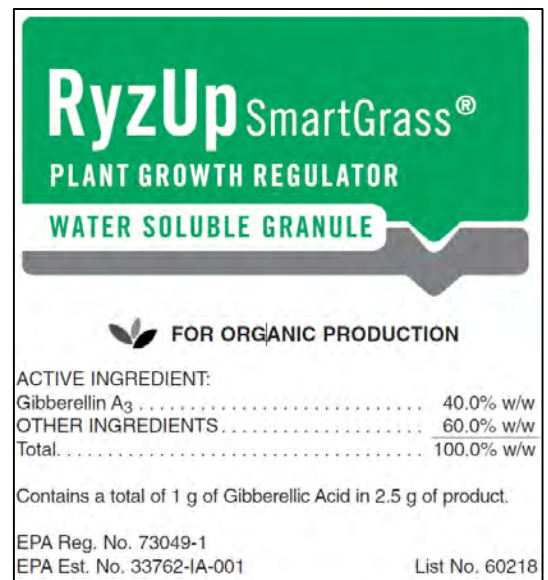
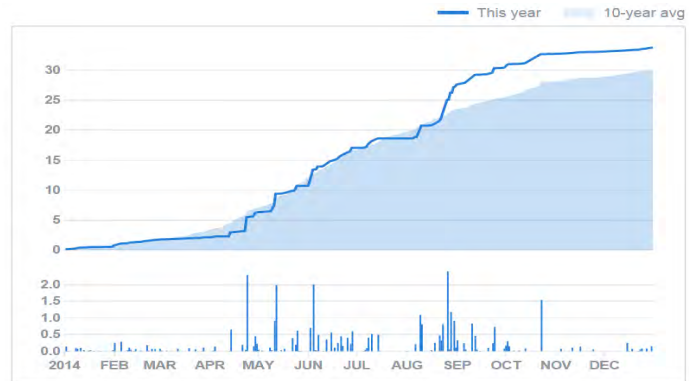
Introduction: This study was designed to look at the effect of RyzUp Smartgrass® Growth Regulator by Valent® BioSciences at the rate of 0.5 oz/acre applied at V7 on 6/20/14 compared to none. Product label is shown at right. No surfactant was used in the application of RyzUp SmartGrass®.

Insecticides/Fungicides: 6 oz/ac Brigade at planting

Fertilizers: 150 lb N/ac anhydrous ammonia in spring. 10 gal/ac 10-34-0 at planting as starter.

Irrigation: Pivot, July: 3.5", August: 0.9"

Rainfall:



Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Check	223 A*	20.1 A	\$780.50
RyzUp Smartgrass®	223 A	20.1 A	\$764.39
<i>P-Value</i>	0.5562	0.7849	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn price, \$9.30/ac product cost, and \$6.81/ac application cost.

Summary: The RyzUp Smartgrass® treatment did not result in a significant yield increase. Net returns for RyzUp Smartgrass® treated corn were lower due to increased cost of production which were not recovered.

Torque™ on Corn

Study ID: 007155201403

County: Saunders

Soil Type: Yutan silty clay loam

Planting Date: 5/18/2014

Harvest Date: 10/31/2014

Population: 26,000

Row Spacing: 15"

Reps: 5

Previous Crop: CRP

Tillage: no-till

Herbicides:

Pre: 4.5 oz/ac Corvus and 1 lb/ac Atrazine 90 DF on 5/19/201

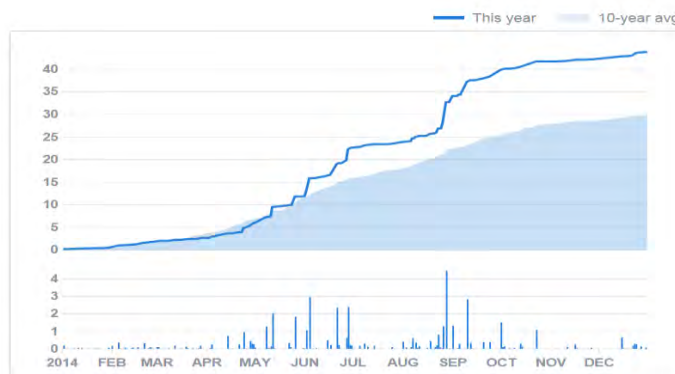
Post: 3 applications of 48 oz/ac Buccaneer Plus to kill CRP grass at V-10 growth stage.

Insecticides/Fungicides: Acceleron 250

Fertilizer: 10 gal/ac 10-34-0 and 1 pt/ac Zinc chelate (Zn-EDTA) in furrow. 110 lb/ac actual N as UAN 32% post-emerge, and 1.5 qt/ton Agrotain Ultra.

Irrigation: Not irrigated

Rainfall:



Soil Test Values:

pH	BpH	NO ₃ -N -lbs/acre-	P	K	S	Ca	Mg	Na	Zn	Na %
-----ppm-----										
5.9	6.7	81.0	14	330	28	2,093	404	23	0.9	1.0

Introduction: The purpose of this study was to determine if the product Torque™ improved corn yields following a long term CRP planting of warm season grass. The product was applied at a rate of 16 oz/ac with starter fertilizer. Product ingredients at right. Two different hybrids were used in the study.

MINIMUM GUARANTEE

ACTIVE: 2 x 10⁻⁷% lipo-chitooligosaccharide (LCO) formulated for corn applications

OTHER INGREDIENTS: Aqueous carrier > 99%

Results: Because there was no interaction between hybrid and Torque these factors were analyzed separately.

Hybrid:	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Channel 211-00DGV2PRIB	169 A*	16.1% B	\$505.38
Channel 211-98VT2PRIB	176 A	17.2% A	\$539.95
<i>P-Value</i>	0.3601	0.0001	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn price, \$265/bag Channel 211-00DGV2PRIB, and \$234/bag Channel 211-98VT2PRIB.

Population:	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Check	164 B*	16.4% A	\$574.00
Torque™	181 A	16.9% A	\$624.94
<i>P-Value</i>	0.0136	0.1798	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn price, \$8.56/ac Torque™ price.

Summary: There was a significant difference in moisture but no significant difference in yield between the two hybrids. The application of Torque™ resulted in a significant increase in yield and no significant difference in moisture. The increase in yield resulted in an approximate gain in net return of \$50.00.

Torque™ on Corn

Study ID: 026185201401

County: York

Soil Type: Hastings silt loam

Planting Date: 4/29/2014

Harvest Date: 10/9/2014

Population: 34,000

Row Spacing: 30"

Hybrid: Pioneer 33D53

Reps: 6

Soil Test Values: Not available

Previous Crop: Soybeans

Tillage: Ridge till

Herbicides:

Pre: 2.1 qt/ac Bicep II Magnum FC of Bicep II Magnum at planting.

Post: 32 oz/ac Glyphosate with 1 lb/ac sugar on 6/11/2014

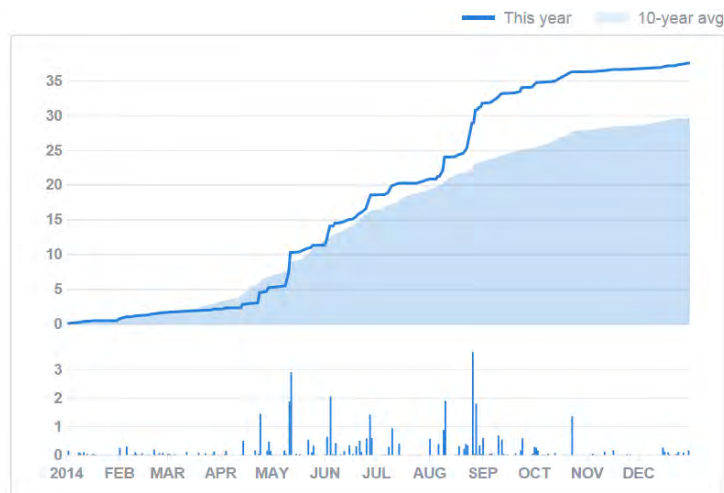
Insecticides/Fungicides: Unknown

Fertilizer: 165 lb/ac anhydrous ammonia pre-plant. 4 gal/ac 10-34-0 at planting.

Irrigation: Pivot, July: 2.5", Aug: 2.5"

Note: Hailed 6/4/14, 7/7/14, 7/31/14

Rainfall:



Introduction: This study was designed to determine the effect of applying Torque™ to corn and its effect on yield and corn production economics. The Torque™ treatment was compared to untreated checks. Torque™ was applied at 8 oz/ac in-furrow with the starter fertilizer.

MINIMUM GUARANTEE

ACTIVE: 2 x 10⁻⁷% lipo-chitooligosaccharide (LCO) formulated for corn applications

OTHER INGREDIENTS: Aqueous carrier > 99%

Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Check	205 A*	16.9 A	\$717.50
Torque™	204 A	17.0 A	\$708.50
P-Value	0.3823	0.1019	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn price and \$5.50/ac Torque™ cost.

Summary: There was no significant difference in yield or moisture between the check and the Torque™ treatment.

Torque™ on Corn

Study ID: 032035201402

County: Clay

Soil Type: Hastings silt loam

Planting Date: 5/1/2014

Harvest Date: 11/7/2014

Population: 33,000

Row Spacing: 30"

Hybrid: Pioneer 32B16

Reps: 6

Previous Crop: Soybeans

Tillage: No-Till

Herbicides: Pre: None

Post: 1.5 qt/ac Lexar on 5/6/2014 and 32 oz/ac Touchdown Total on 6/11/2014

Insecticides/Fungicides: 1.2 oz/ac Baythroid XL on 5/6/2014. 2 oz/ac Priaxor on 6/11/2014 and 10.5 oz/ac Quilt Xcel on 7/19/2014.

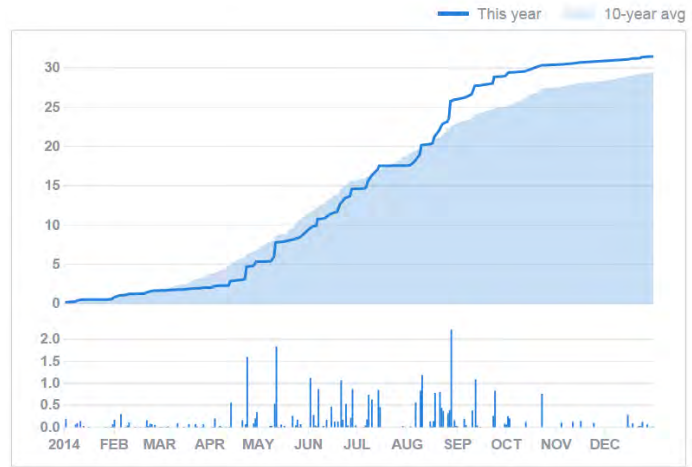
Additional applications: 1 qt/ac Plen-T-Sweet on 6/11/2014 and 1 qt/ac Sweet'n Eezy on 7/19/2014

Soil Test: (Average for field)

Fertilizers: Fall application of 167 lb actual N/ac Anhydrous ammonia with a variable rate application of 11-52-0. 1 gal/ac 28-0-0 on 6/11/2014 and 1 gal/ac 10-0-10 on 7/19/2014.

Irrigation: Pivot

Rainfall:



	pH	BpH	OM ---%---	Nitrate -----	P	K	Ca	Mg	Na	Ca	Zn
	ppm-----										
Average	6	7	3	8	25	366	2001	273	37	10	1

Introduction: The purpose of this study is to determine the effect of Torque™ growth promoter on corn yield. This is the second year for this study (2013 results shown below right). Torque™ was applied during planting at a rate of 8 oz/acre. Percent moisture, stalk rot, and plant population data were also collected at harvest.

Product label shown below left.

MINIMUM GUARANTEE
ACTIVE: 2 x 10 ⁻⁶ % lipo-chitooligosaccharide (LCO) formulated for corn applications
OTHER INGREDIENTS: Aqueous carrier > 99%

Producer	Avg Yield Check	Avg Yield Torque
2013 Clay Co. (8 reps)	254.8 18.4% moisture (11.7% stalk rot) 31,667 Stand Count	255.3ns 18.4% moisture ns (13.3% stalk rot) 31,000 Stand Count
No statistical differences in 2013 (alpha=0.05) and 2014 (alpha=0.10)		
Check treatment: 3 gal. 10-34-0 + 1 qt/ac micromax (2% Magnesium, 0.25%B, 2%Zn, 1.6%Fe, 0.5%Cu)		
Torque: Check treatment + 0.5 pt/ac Torque		

Results:

	Yield† (bu/acre)	Moisture (%)	Stalk Rot (%)	Harvest Pop	Net Return ‡
Check	283 A*	16.8 A	6.7 A	31,333 A	\$990.50
Torque™	284 A	16.9 A	12.5 A	28,083 B	\$989.00
P-Value	0.2156	0.1747	0.2875	0.0084	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn price and \$5.00/ac Torque™ cost.

Summary: There was no significant difference in yield, moisture, or stalk rot between the Torque™ treatment and the check. There was a significantly lower harvest population for the Torque™ treatment.

RyzUp Smartgrass® Growth Regulator on Soybeans

Study ID: 037023201402

County: Butler

Soil Type: Unknown

Planting Date: 5/31/2014

Harvest Date: 10/14-15/2014

Population: 172,000

Row Spacing: 30"

Hybrid: NK S26-E5

Reps: 3

Soil Test Values: Unknown

Previous Crop: Seed corn

Tillage: Unknown

Herbicides: Pre: Unknown

Post: Unknown

Insecticides/Fungicides: Unknown

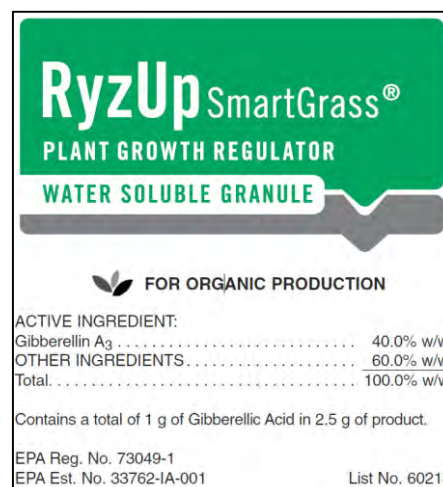
Fertilizers: Unknown

Irrigation: Pivot

Rainfall: Unknown

Introduction: This study was a comparison between two application strategies of RyzUp Smartgrass® on soybeans. The first treatment was one application of 0.3 oz/ac RyzUp Smartgrass® with 1 qt/100 gal (13.3 gal/ac) Synurgize as surfactant at the first trifoliolate on 6/19/2014. The second treatment was one 0.3 oz/ac application of RyzUp Smartgrass® with Synurgize surfactant at the first trifoliolate on 6/19/2014 as well as an additional 0.3 oz/ac application at the second trifoliolate on 6/24/2014.

Results: The single application and double application treatments were applied in different locations in the field thus these two approaches were analyzed separately.



	Yield† (bu/acre)	Protein (%)	Weight (g/100 seeds)	Oil (%)	Net Return ‡
Check	66 B*	36.5 A	17.2 A	17.9 A	\$660.00
RyzUp Smartgrass® – Single Treatment	73 A	36.1 A	17.7 A	18.0 A	\$716.48
<i>P-Value</i>	0.0057	0.2446	0.3028	0.3364	--

	Yield† (bu/acre)	Protein (%)	Weight (g/100 seeds)	Oil (%)	Net Return ‡
Check	67 A*	36.4 A	16.9 A	17.9 A	\$670.00
RyzUp Smartgrass® – Double Treatment	63 B	36.2 A	17.4 A	18.0 A	\$602.96
<i>P-Value</i>	0.0269	0.1568	0.2269	0.4154	--

†Bushels per acre corrected to 13.0% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$10.00/bu soybean price, \$13.52/application RyzUp Smartgrass® cost (\$7/ac RyzUp Smartgrass®, \$0.52/ac Synurgize, \$6.00/ac application cost).

Summary: The single treatment of RyzUp Smartgrass® resulted in a significant increase in yield compared to the check. This gave an increased net return of approximately \$56. There was no significant difference in the weight, protein or oil contents with the single treatment. The double treatment of RyzUp Smartgrass® resulted in a significant decrease in yield with no significant difference in the weight, protein, or oil contents when compared to the check. The double treatment resulted in an approximate loss of \$70 in net return.

PreCede® on Soybeans

Study ID: 040023201401

County: Butler

Soil Type: Unknown

Planting Date: 5/21/2014

Harvest Date: 10/8/2014

Population: 168,000 seeds/ac

Row Spacing: 30"

Hybrid: Seitec 8261

Reps: 8

Soil Test Values: Not available

Previous Crop: Unknown

Tillage: Unknown

Herbicides: Pre: Unknown

Post: Unknown

Insecticides/Fungicides: Unknown

Fertilizers: Unknown

Irrigation: Yes

Rainfall: Unknown

Introduction: The purpose of this study is to determine effects of PreCede® on soybean yield and quality. 16 ounces per 1000 lbs seed was applied. PreCede® analysis is at right.

PreCede Family	Analysis	Rate
PreCede Soy	0.25 + Transit	1 L/MT

Results:

	Trifoliolate June 17	Trifoliolate June 23	Trifoliolate July 1	Trifoliolate July 8	Trifoliolate July 21
Check	2.3 A	3.8 A	5.6 A	7.1 A	9.6 A
PreCede®	2.3 A	3.8 A	5.8 A	7.1 A	9.9 A
<i>P-Value</i>	0.1894	0.6715	0.1729	0.8882	0.1219

	Chlorophyll June 17	Chlorophyll June 23	Chlorophyll July 1	Chlorophyll July 8	Chlorophyll July 21
Check	26.2 A	26.4 A	28.5 A	31.0 A	36.7 B
PreCede®	26.7 A	26.6 A	29.4 A	31.0 A	37.4 A
<i>P-Value</i>	0.4429	0.7003	0.3373	0.9607	0.0527

	Height (in) June 7	Height (in) July 1	Height (in) July 8	Height (in) July 21	Stem Height (in) June 23	Trifoliolate Height (in) June 21
Check	8.5 A	8.4 A	10.4 A	16.8 B	4.8 A	1.8 A
PreCede®	8.7 A	8.3 A	10.3 A	17.3 A	4.8 A	1.8 A
<i>P-Value</i>	0.4071	0.6412	0.9172	0.0160	0.6308	0.5390

	Yield† (bu/acre)	Oil (%)	Protein (%)	Population June 6	Pods July 31	Pods Aug. 21	Net Return ‡
Check	73 A*	20.1 A	32.9 B	115,652 A	36.5 A	35.3 B	\$730.00
PreCede®	73 A	19.5 B	33.8 A	114,672 A	37.7 A	36.9 A	\$728.28
<i>P-Value</i>	0.6835	0.0036	0.0235	0.8347	0.5370	0.0346	--

†Bushels per acre corrected to 13.0% moisture.

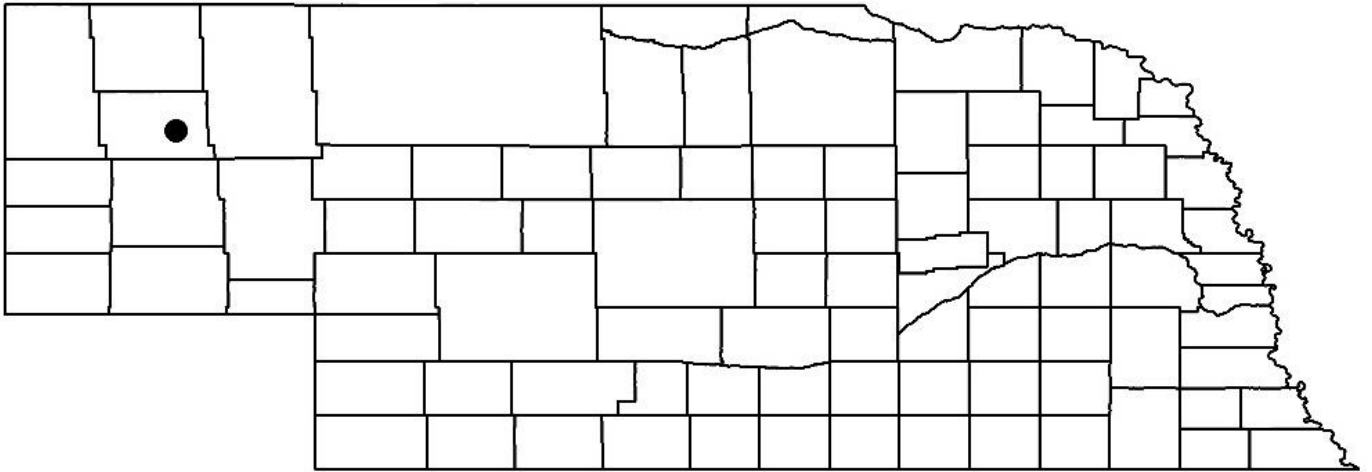
*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$10.00/ac soybean price and \$1.72/ac PreCede cost.

Summary: The addition of PreCede® seed treatment resulted in no significant differences in trifoliolate count, chlorophyll content, and plant height except for on July 21st when chlorophyll content and plant height were significantly greater for the PreCede® treatment. There was a significant increase in protein content and a significant decrease in oil content for PreCede® treatment. The pod count on August 21st saw a significant increase with PreCede®. There was no significant difference in yield between the PreCede® treatment and the check. This resulted in a decline in net return equal to the cost of the PreCede® treatment.

Harvest Method Study

Harvest Method Locations:



Harvest Methods in Dry Edible Beans

Study ID: 015013201401

County: Box Butte

Soil Type: Creighton & Alliance- Sandy Loam

Planting Date: 6/18/2014

Harvest Date: 10/16/2014

Population: 109,423

Row Spacing: Drilled 7.5"

Reps: 4

Previous Crop: Corn

Tillage: Minimum Till

Herbicides: Pre: Outlook – label rate **Post:**

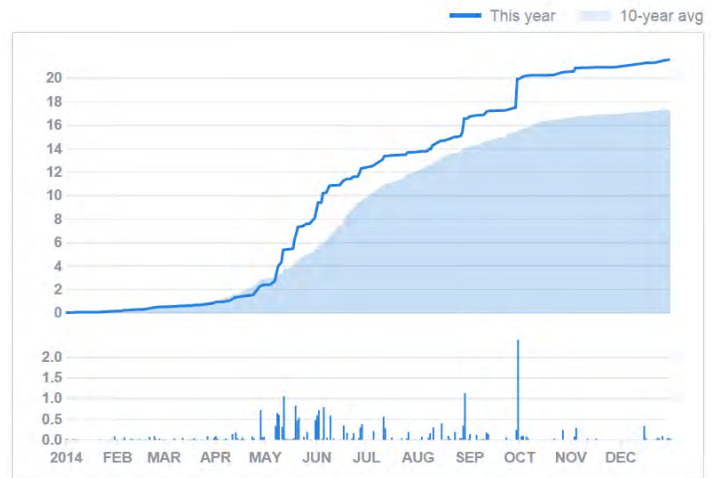
Raptor/Result - label rate

Insecticides/Fungicides:

Fertilizer: Standard bean fertilization for 80 bu yield

Irrigation: Irrigated – amounts unknown.

Rainfall:



Introduction: The purpose of this study was to compare 4 different Great Northern bean varieties in a direct harvest bean production system looking at both yield and harvest loss. Traditionally dry beans are harvested in a three step process starting with undercutting with a blade or rod, then windrowing, and finally combining. In recent years the undercutting and windrowing were combined as one process and then the combine would come through as the second process. This two-step process is the most common process at present. Yield loss in the three step method or two step method in ideal conditions can be 1.5 bu/ac. Harvest loss can be much higher with these methods when wind blows the cut beans or untimely weather events occur. Direct harvest is simply one pass through the field with the combine, leaving the beans safer from weather events up until the time of combining (Figure 1). A good upright bean variety, proper level field conditions and a combine header suitable for direct harvest are essential to minimize harvest loss and economically justify direct harvest. The beans in this study were harvested in the late morning. Harvesting in cooler or more humid conditions can reduce harvest loss.



Figure 1: Direct Harvest with draper head.

Results:

	Yield† (bu/ac)	Yield Loss (bu/ac)	White Mold Rating	Stand Count	Net Return ‡
Great Northern A	23.9 A*	6.7 A	7.50 A	101,059 A	\$429.30
Great Northern B	20.1 AB	3.7 B	5.75 B	106,286 A	\$360.80
Great Northern C	19.4 B	7.0 A	6.25 B	108,029 A	\$348.30
Great Northern D	19.2 B	3.6 B	7.875 A	122,317 A	\$344.70
P-Value	0.0669	0.0121	0.0006	0.3462	--

†Bushels per acre not corrected to dry moisture. Moisture was very close to the 14% standard.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$30/cwt (\$18/bu @ 60lb/bu)

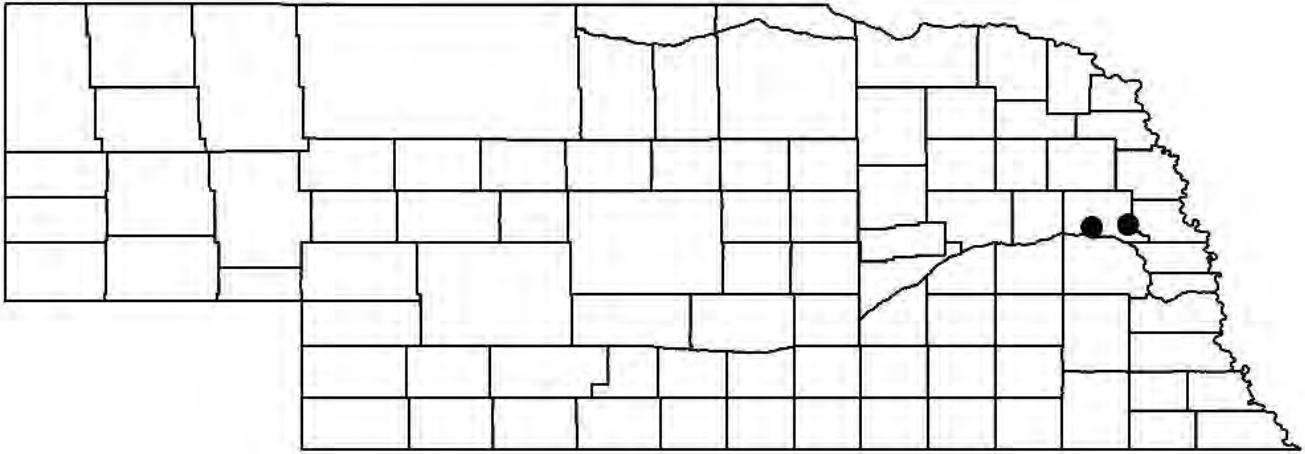
Summary: Due to a serious outbreak of white mold (Figure 2) in September these varieties and the surrounding field were grown at an economic loss. Beans selling around \$28/cwt would have to yield about 35 bu/ac to break even. Variety A yielded better than the rest and there were differences in harvest loss and white mold ratings giving some insight into variety disease resistance. The quality of the beans harvested was good as the damaged beans went out the back of the combine.



Figure 2: White mold in beans.

Seed Treatment Studies

Seed Treatment Locations:



Insecticide Seed Treatments in Rainfed Corn

Study ID: 029053201403
County: Dodge
Soil Type: Moody – Silty Clay Loam
Planting Date: 5/4/2014
Harvest Date: unknown
Population: 28,000
Row Spacing: 36”
Hybrid: P32T82
Reps: 4
Soil Test Values: not available
Previous Crop: Soybeans
Tillage: No-Till
Herbicides: Pre: 4 oz. Balance Flexx + Atrazine 4 L + 1 pt. Parallel Plus – 4/15/14
Post: 3 oz. Laudis + 1 qt. Cornerstone Plus + ½ pt. Atrazine 4 L – 6/11/14
Insecticides/Fungicides: none

Fertilizer: 30 gal. UAN 32% – Mid April, 6 gal. MAP + 7 lbs. Zinc Sulfate – at planting in-furrow
Note: Hailed at V5 (6/4/14) with around 5,000 plants/acre stand loss
Irrigation: not irrigated
Rainfall:



Introduction: The purpose of this study was to compare two seed treatments for their impact on yield and net return. The first seed treatment was Cruiser® 250 insecticide and the second was VOTiVO®+Poncho® 1250 insecticide plus nematocide.

Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Cruiser 250®	179 A*	18.4 A	\$549.41
VOTiVO®+Poncho® 1250	177 A	18.3 A	\$555.97
P-Value	0.5111	0.3489	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn, \$63.53/acre VOTiVo + Poncho 1250 treated seed, and \$77.09/acre Cruiser 250 treated seed.

Summary: There was no significant yield or moisture difference between the two seed treatment evaluated.

Clariva™ Seed Treatment on Soybeans

Study ID: 010053201401

County: Dodge

Soil Type: Janude loam, clayey substratum and Zook silt loam

Planting Date: 5/5/2014

Harvest Date: 10/9/2014

Population: 160,000 seeds/ac

Row Spacing: 30"

Hybrid: Pioneer 92Y83

Reps: 7

Previous Crop: Corn

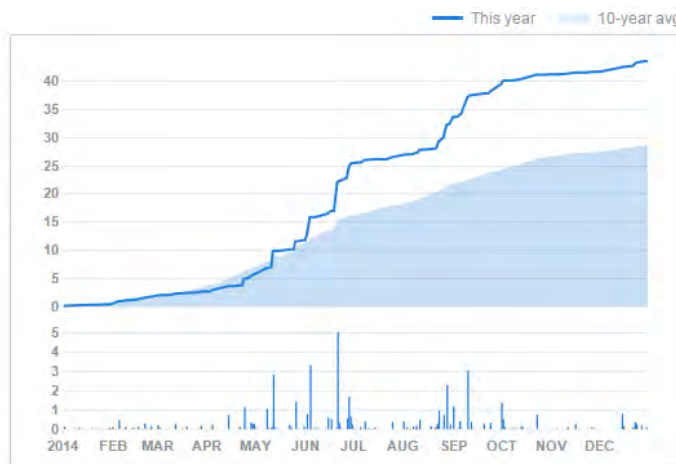
Tillage: No-till

Herbicides: Pre: Not available
Post: Not available

Insecticides/Fungicides: Poncho/VOTiVO® Seed Treatment

Irrigation: Pivot

Rainfall:



Introduction: This field had suspected high levels of soybean cyst nematode (SCN). This pest can significantly lower soybean yields without any visual symptoms on the plant. A seed treatment product Clariva™ Complete is promoted as a product that offers protection against SCN. This product was tested for ability to increase soybean yield. All seed (both check and Clariva™ treated seed) were treated with Poncho/VOTiVO®. The variety used was rated at 8 (out of 9, with 9 being the best) for SCN Race 3 and 6 for SCN Race 14. Following the 2014 growing season, samples were taken for SCN and came back positive with an average of 660 eggs per 100 cc of soil (3 oz) for the field. Below are the results of the SCN test by strip. The soil samples were not taken in all of the treatments of the paired comparison therefore statistical difference of the SCN egg counts by treatment cannot be obtained.

	SCN Results (eggs per 100 cc's of soil (3oz))				
	Sample 1	Sample 2	Sample 3	Sample 4	Average
With Clariva™	2200	280	840	240	890
Check	400	800	160	360	430

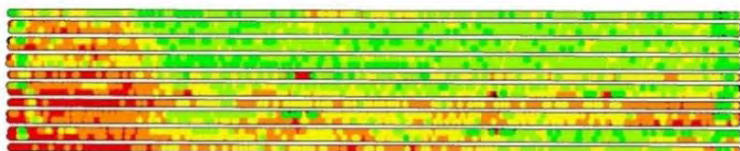
Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Check	63 A*	12.4 A	\$630.00
Clariva™	63 A	12.8 A	\$609.00
<i>P-Value</i>	<i>0.6176</i>	<i>0.2986</i>	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$10/bu soybeans and \$21/ac Clariva™.



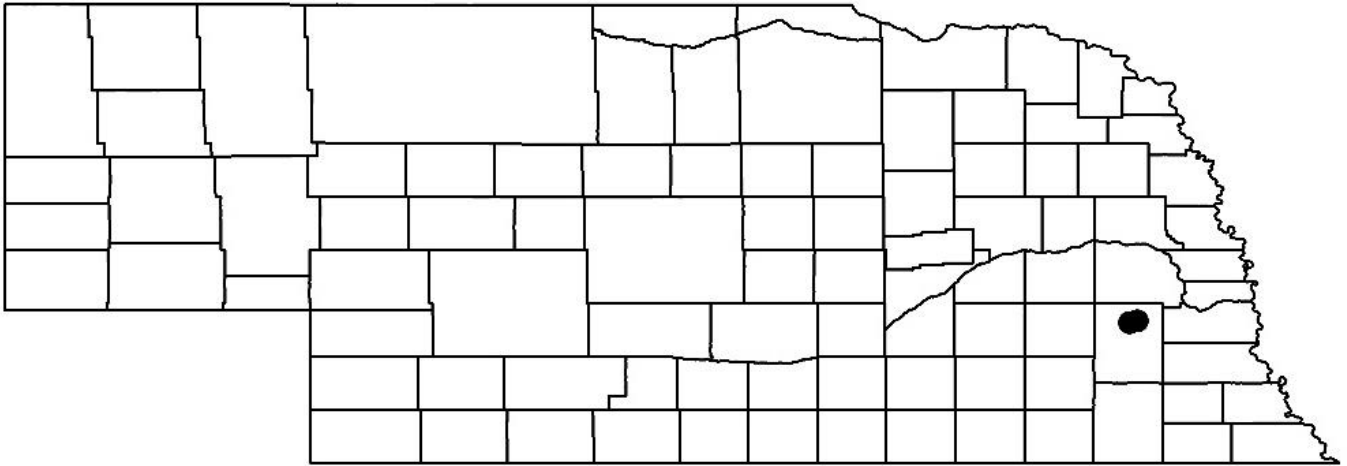
bu/ac

- 31.2 - 54.6
- 54.61 - 60.7
- 60.71 - 66.0
- 66.01 - 72.4
- 72.41 - 91.1

Summary: Although this field tested positive for soybean cyst nematode, the Clariva™ seed treatment did not result in a yield increase, and therefore had lower net returns.

Insect Control Traits in Corn

Insect Control Traits Study Locations:



Evaluating the Yield Response of Insect Control Traits in Rainfed Corn

Study ID: 030109201402

County: Lancaster

Soil Type: Kennebec/Judson/Sharpsburg –
Silty Clay Loam

Planting Date: 4/26/2014

Harvest Date: 11/5/2014

Population: 30,000

Row Spacing: 30"

Hybrid: Channel 217-07/08

Reps: 8

Previous Crop: Soybeans

Tillage: No-Till

Herbicides: **Pre:** 2.1 qt. Trizmet II Early
March Post: 1.87oz Callisto + 24 oz Roundup
PowerMAX – Early June.

Insecticides/Fungicides: Poncho 250,
Acceleron

Fertilizer: 160 lbs NH₃ – November 2013.

Irrigation: Not Irrigated

Rainfall:



Introduction: Corn hybrids today can be purchased with and without pest management traits. The purpose of this study was to evaluate the performance of two hybrids genetically the same except for the addition of the corn rootworm trait.

Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Channel 217-07 VT2	225 A*	17.4 A	\$785.79
Channel 217-08 VT3	222 A	17.2 B	\$763.91
P-Value	0.1127	0.0148	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50 corn and \$12.43/acre marginal additional cost for VT3 trait over VT2

Summary: There was no yield difference between the hybrid with and without pest management traits. Moisture was higher for the VT2 hybrid when compared to the VT3 hybrid.

Evaluating the Yield Response of Insect Control Traits in Rainfed Corn

Study ID: 030109201403

County: Lancaster

Soil Type: Kennebec/Judson – Silt Loam

Planting Date: 4/19/2014

Harvest Date: 11/10/2014

Population: 28,000

Row Spacing: 30"

Hybrid: DKC 62-97

Reps: 8

Previous Crop: Soybeans

Tillage: No-Till

Herbicides: Pre: 2.1 qt Trizmet II Early March

Post: 1.87 oz Callisto + 24 oz Roundup

PowerMAX – Early June.

Insecticides/Fungicides: Poncho 250,

Acceleron

Fertilizer: 160 lbs NH₃ – November 2013.

Irrigation: Not irrigated

Rainfall:



Introduction: Corn hybrids today can be purchased with and without pest management traits. The purpose of this study was to evaluate the performance of two hybrids genetically the same except for the addition of the corn rootworm trait.

Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
DKC 6297 VT2	221 A*	16.62 A	\$773.12
DKC 6297 VT3	221 A	16.70 A	\$764.02
P-Value	0.9749	0.4749	--

†Bushels per acre corrected to 15.5% moisture.

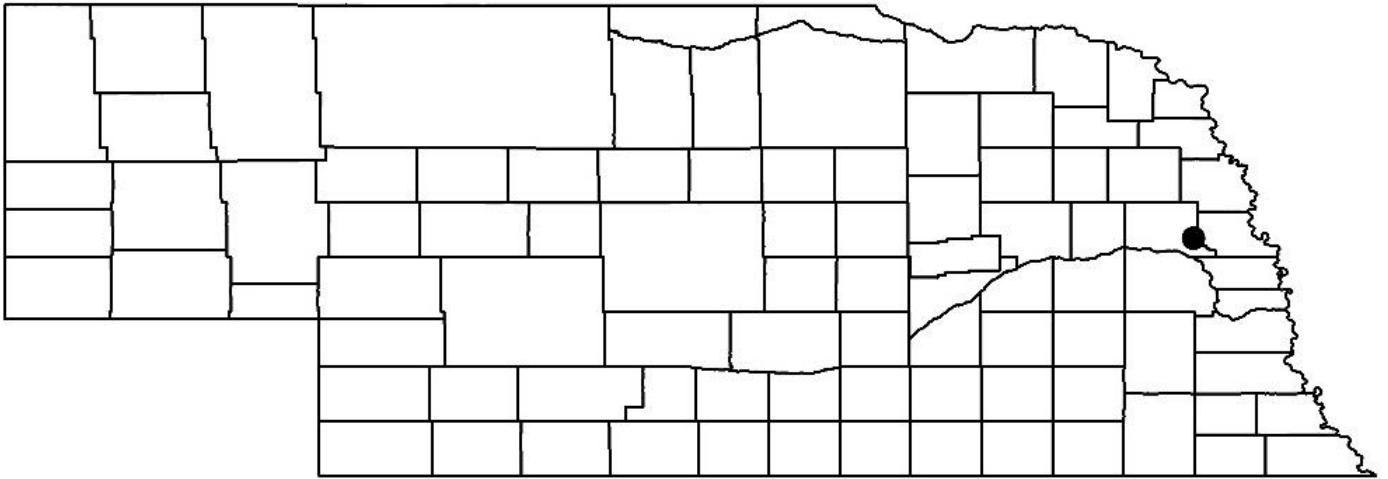
*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50 corn and \$9.31/acre marginal additional cost for VT3 trait over VT2

Summary: There was no yield or moisture difference between the hybrid with and without pest management traits.

Lime Study

Lime Study Location:



Lime and Tillage Interaction on Rainfed Corn

Study ID: 029053201402

County: Dodge

Soil Type: Moody – Silty Clay Loam

Planting Date: 5/4/2014

Harvest Date: unknown

Population: 28,000

Row Spacing: 36"

Hybrid: Golden Harvest G16K01

Reps: 5

Previous Crop: Soybeans

Tillage: No-till

Herbicides: Pre: 4 oz Balance Flexx + 4 oz Atrazine

4L + 1 pt Parallel Plus - 4/5/14 **Post:** 4 oz

Capreno + 1 qt Cornerstone Plus + ½ pt

Atrazine 4L – 6/11/14

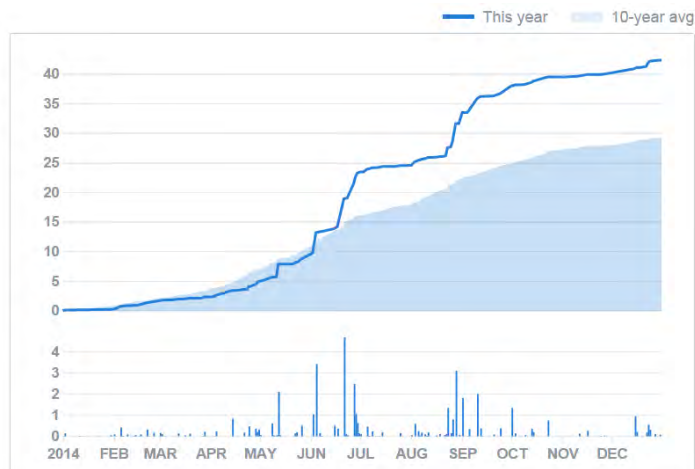
Insecticides/Fungicides: Cruiser 250 seed treatment

Fertilizer: UAN 32% 30gal – Mid April, MAP 6gal + Zinc Sulfate 7lb at planting in-furrow.

Note: Hailed at V5, (6/4/14)

Irrigation: Not irrigated.

Rainfall:



Introduction: This is a long term study initiated in 2001 to determine the effect lime and tillage had on future corn and soybean yields. The field where this study was conducted consisted of a Moody Silty Clay Loam soil with a soil pH of 5.5 in 2001. 2.4 T/ac ag lime was applied in 2001. Corn and soybean yields were captured each year of the study.

2001: There was no yield interaction between tillage and lime. Soybean yields were increased for the tillage operation as compared to no-till and for the lime application as compared to no lime.

2002: There was no yield interaction between tillage and lime. Corn yields were decreased for the previously tilled treatment versus the no-till treatment; yields were increased for the lime application as compared to no lime application.

2003: No yield was collected.

2004: There was no yield interaction between tillage and lime. There was no corn yield difference between the tilled and no-tilled treatments; yields were increased for the lime treatment as compared to the no-lime treatment.

2005: There was no yield interaction between tillage and lime. There was no soybean yield difference between the tilled and no-tilled treatments; yields were increased for the lime treatment as compared to the no-lime treatment.

2006: There was no significant yield difference for the interaction of tillage and lime, or for tillage and lime independently.

Soil tests were taken by treatment strip in 2006. The results are in the following table.

Treatment	Water pH by depth (in)			
	0-2	2-4	4-6	6-8
No Tillage, No Lime	5.9	5.3	5.6	5.4
No Tillage, Lime	6.6	5.5	5.5	5.7
Tillage, No Lime	5.8	5.3	5.5	5.6
Tillage, Lime	6.6	5.8	5.5	5.7
	Buffer pH by depth (in)			
	0-2	2-4	4-6	6-8
No Tillage, No Lime	6.7	6.5	6.6	6.5
No Tillage, Lime	7.0	6.6	6.5	6.7
Tillage, No Lime	6.4	6.5	6.6	6.6
Tillage, Lime	7.0	6.6	6.5	6.6

2007: There was no yield interaction between tillage and lime. There was a significant difference for lime with the lime treatment having higher soybean yields than the no-lime treatment. NDVI was also collected and there was a significant interaction between lime and tillage. NDVI was increased slightly by tillage where no lime was applied, however lime increased NDVI significantly regardless of tillage.

2008: Corn yields were not increased by lime application.

2009-2011: Soybean and corn yields were not different for lime or tillage treatments.

Soil samples were again taken in 2011 at a depth of 0-8 inches in only the no-till strips. The results are in the following table.

Treatment	Sample Number	Lab pH	Buffer pH	P ₂ O ₅	K	OM	S
Lime	6529	5.6	6.5	6	270	2.79	11
	6530	5.5	6.5	10	305	3.09	12
	6531	5.9	6.5	13	283	3.09	10
No Lime	6532	5.5	6.5	8	309	3	11
	6533	5.7	6.5	4	217	3	12
	6534	5.6	6.5	8	208	-	-

In 2011 lime was reapplied (2 tons/ac) to the strips previously limed (2.4 tons/ac) in 2001. The tillage treatments from 2001 were also repeated. The lime was incorporated in tilled strips with turbo till in fall 2011 and double disking in spring 2012. Corn and soybean yields were captured each year of the study.

2012: There was no significant corn yield interaction between lime and tillage treatments. There was no yield difference between the lime and no-lime treatments; yields were significantly higher for the no-till versus the tilled treatment.

2013: There was no significant soybean yield interaction between lime and tillage treatments. There was no yield difference between the tilled and no-till treatments; the lime treatment was significantly higher yielding than the no lime treatment.

Results:

This study was analyzed to check for interactions between tillage and liming. There was no interaction therefore the factors of lime and tillage were analyzed separately. The tillage event occurred in 2011 only, therefore no tillage costs are factored in. Lime costs were prorated for 8 years.

Tillage:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
No-Till	160 A*	17.4 A	\$559.30
Till	156 B	17.4 A	\$531.75
<i>P-Value</i>	<i>0.0300</i>	<i>0.6743</i>	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
No Lime	161 A	17.5 A	\$563.50
Lime	154 B	17.3 B	\$535.76
<i>P-Value</i>	<i>0.0010</i>	<i>0.0159</i>	--

†Bushels per acre corrected to 15.5% moisture.

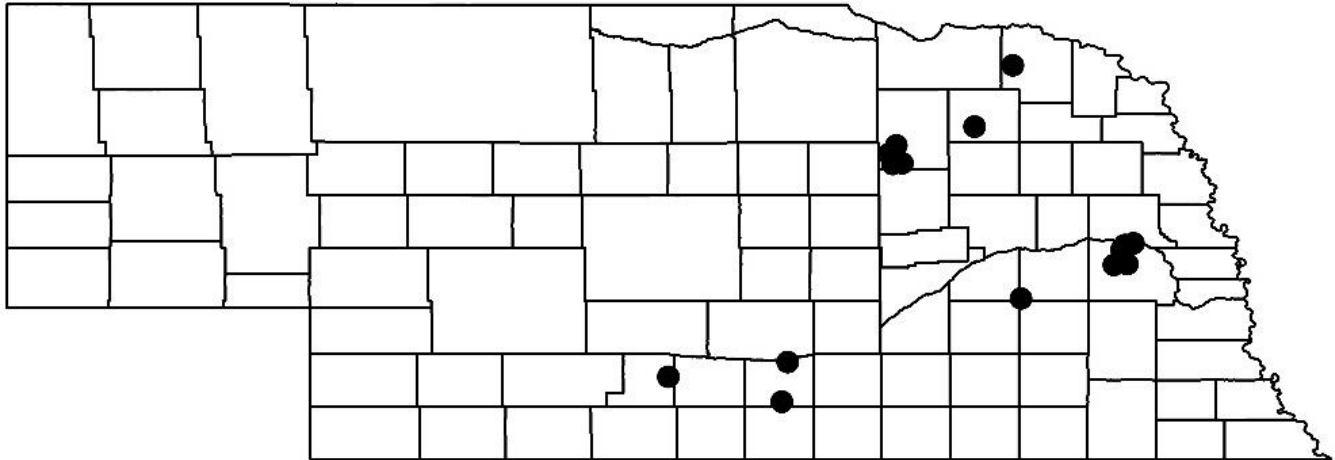
*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn, and \$3.24/ac/yr prorated lime costs for 8 years.

Summary: This year, yields for the no-till treatment were significantly higher than for the till treatments. Yields for the no lime treatment were significantly higher than for the lime treatment.

Foliar Micro-Nutrient Studies

Foliar Micronutrient Study Locations:



Micronutrient foliar sprays are of widespread use in agricultural production and are commonly used as a complementary strategy to soil fertilization. While plant leaves are specialized in capturing light and CO₂, their ability to absorb nutrients has long been recognized and used in nutrient management (Fernandez and Eichert, 2009). Although above ground plant parts are protected against uncontrolled exchange of elements from the environment, elements may still penetrate through either the cuticle (solutes) or through the stomata (gases and solutes)(Marschner, 2012).

Micronutrients such as boron (B), manganese (Mn), iron (Fe), and zinc (Zn), are essential to plant physiological function and are needed in relatively small but critical amounts by corn and soybeans (Marschner, 2012). Each of these micronutrients are of general interest to Nebraska producers and agronomists and were selected for inclusion in this trial. Numerous soil properties can limit micronutrient solubility and uptake by plant roots. For example, micronutrients (e.g. Fe, Mn, Cu, and Zn) have limited availability in high pH, calcareous soils (Wortmann, Ferguson, et al., 2013). Thus, micronutrient foliar sprays are of general interest as tools to manage these nutrients and subsequently bypassing these soil limitations.

Advances in corn yields have increased the removal of nutrients harvested. While Nebraska soils are generally fertile, corn has a high rate of nutrient uptake during the V4 to VT stage and demand may exceed supply. The application of foliar micronutrients to correct or avoid micronutrient deficiencies under conditions where soils provide limited availability of such micronutrients is one of the most commonly practiced uses of foliar fertilization worldwide (Fageria et al., 2009; Kannan, 2010). Plant responses to foliar micronutrients are normally more rapid than soil applications and generally have higher recovery rates applied foliarly as compared to soil applications (Marschner, 2012). Therefore, foliar applied micronutrients are of importance in nutrient correction within a given growing season.

As yield increases, producers are generally applying higher levels of macronutrients which may increase the risk of micronutrient deficiencies. Liebig's law of the minimum states that yield is proportional to the most limiting nutrient. For example, as sufficient levels of each of the macronutrients are being met, this increases the likelihood of a micronutrient deficiency being the yield limiting factor (Marschner, 2012).

However, the effectiveness of foliar micronutrient treatments varies significantly among plant species and in relation to their ingredients such as: salts, surfactants, complexes, or chelates (Zhang and Brown, 1999; Woljick, 2004; Fernandez and Ebert, 2005). Recent foliar trials of micronutrient foliar fertilizers on corn have seen mixed results with one trial reporting an increase in corn grain yield of nearly 18% for a three year average with the application of 1.0 to 1.5 kg foliar Zn/ha (Potarzycki and Grzebisz, 2009), while many others report no significant increase in yield (Mallarino, 2014, Heckman, 2002-2003, Mueller and Diaz, 2012, Nelson and Meinhardt, 2011).

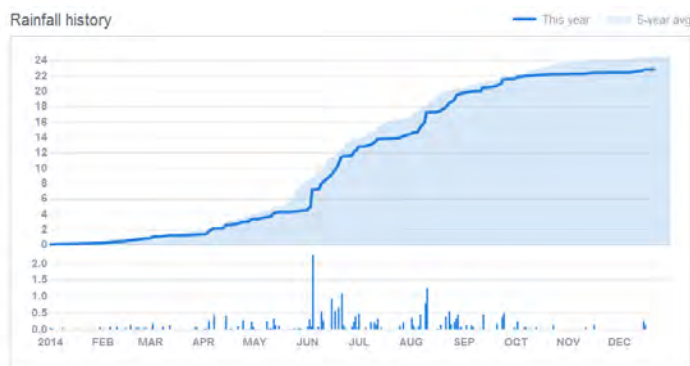
The objective of the first 10 trials reported was to evaluate the effect of foliar micronutrient treatments on corn in high yielding situations in Nebraska which were previously identified as "low or deficient" of one or more micronutrient (B, Fe, Mn, Zn) from soil or leaf tissue sampling. The remainder of the studies were also interested in determining the effect of foliar micronutrient treatments, however micronutrients were not necessarily in the "low or deficient" category.

Foliar Micronutrient Application on Corn

Study ID: 017003201401
County: Antelope
Soil Type: Thurman and Nora Loamy Sand
Planting Date: 4/27/2014
Harvest Date: 11/3/2014
Population: 32,000 seeds/acre
Row Spacing: 30"
Hybrid: Pioneer 1625 HR
Reps: 4
Previous Crop: Corn
Tillage: Disk
Herbicides: Post: (5/28/14): 1 pt/acre Atrazine
 3.65 pt/acre Halex GT
 12 oz/acre Roundup PowerMAX
Insecticides/Fungicides: None

Fertilizer: 24 gpa 17-15-0-7 starter at planting
 24-0-0-10 through pivot: 14 gpa on 6/9/14
 UAN 32% through pivot: 14 gpa on 6/19/14
 12 gpa on 7/2/14
 14 gpa on 7/19/14

Irrigation: Pivot – Amounts unknown



Soil Test Values:

OM	pH	NO ₃ -N (0-4")	NO ₃ -N (4-8")	P Bray 1	P Bray 2	K	S	Mn	B	Zn
---%---		-----lbs/acre-----		-----ppm-----						
1.4	6.2	6	2	18 (M)	22 (M)	83 (M)	10 (LO)	6 (L)	0.3 (VL)	4.6 (H)

*VH=Very High, H=High, M=Medium, L=Low, VL=Very Low

Introduction: This study is looking at the effects of foliar fertilizer on corn yield and concentrations of nutrients in leaf tissue samples. The foliar fertilizer used in this study supplied S, B, Mn, and Zn and was applied at a rate of 1qt/ac and was applied aerially on July 10th. Leaf samples were collected from treated and untreated strips approximately 1 month after application and analyzed for nutrient concentrations. Yields were harvested from treated and untreated strips and collected from yield monitor data.

Guaranteed Analysis

Sulfur (S)	3.6%
Boron (B)	0.1%
Manganese (Mn).....	3.0%
Zinc (Zn)	4.0%

Results:

	Yield†	Plant Tissue Samples							Net Return ‡
		N	P	K	S	Mn	B	Zn	
		-----ppm-----							
	<i>(bu/acre)</i>	-----(%)-							
Check	202 B*	2.2 A	0.26 A	2.1 A	0.16 A	38.0 A	6.5 A	19.0 B	\$707
Micronutrient	213 A	2.0 A	0.23 A	1.9 A	0.16 A	58.5 A	5.5 A	25.5 A	\$730.05
P-Value	0.0065	0.4795	0.1257	0.542	--	0.1955	0.7048	0.0489	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn, \$23.79/gal foliar micronutrient, and \$9.50 aerial application cost.

Summary: At this location, the foliar micronutrient treatments had significantly higher yields than the non-treated areas. We looked at the tissue sample values for the nutrients applied in the foliar treatment. There was no difference in plant tissue samples values for S, Mn, or B; however the foliar micronutrient treatments had higher Zn levels in plant tissue than the check. At this site, the increased yield more than covered the cost of application and resulted in higher net return for the foliar treated area.

Foliar Micronutrient Application to Corn

Study ID: 017003201402
County: Antelope
Soil Type: Thurman and Doger Loamy Sand
Planting Date: 5/15/2014
Harvest Date: 11/19/2014
Population: 32,000 seeds/acre
Row Spacing: 30"
Hybrid: 209-53 STX RIB
Reps: 4
Soil Test Values: Not available
Previous Crop: Corn
Tillage: Disked
Herbicides: Post: (5/28/14): 1 pt/acre Atrazine
 3.65 pt/acre Halex GT
 12 oz/acre Roundup PowerMAX
Insecticides/Fungicides: None

Fertilizer: 24 gpa 17-15-0-7 starter at planting
 24-0-0-10 through pivot: 14 gpa on 6/9/14
 UAN 32% through pivot: 14 gpa on 6/19/14
 12 gpa on 7/2/14
 14 gpa on 7/19/14
Irrigation: Pivot – Amounts unknown



Introduction: This study is looking at the effects of foliar fertilizer on corn yield and concentrations of nutrients in leaf tissue samples. The foliar fertilizer used in this study supplied S, B, Mn, and Zn and was applied at a rate of 1qt/ac and was applied aerially on July 10th. Leaf samples were collected from treated and untreated strips approximately 1 month after application and analyzed for nutrient concentrations. Yields were harvested from treated and untreated strips and collected from yield monitor data.

Guaranteed Analysis

Sulfur (S)	3.6%
Boron (B)	0.1%
Manganese (Mn).....	3.0%
Zinc (Zn)	4.0%

Results:

	Yield† <i>(bu/acre)</i>	Net Return ‡
Check	213 A*	\$745.50
Foliar Micronutrient Fertilizer	217 A	\$744.05
P-Value	<i>0.6154</i>	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn, \$23.79/gal foliar micronutrient, and \$9.50/ac aerial application cost.

Summary: At this location, foliar micronutrient treatments did not have significantly different yields than non-treated areas. At this site, no soil or foliar samples were taken.

Foliar Micronutrient Application on Corn

Study ID: 017003201403
County: Antelope
Soil Type: Thurman and Doger loamy sand
Planting Date: 5/15/2014
Harvest Date: 10/24/2014
Population: 32,000 seeds/acre
Row Spacing: 30"
Hybrid: 213-40 VT3
Reps: 2
Soil Test Values: Not available
Previous Crop: Corn
Tillage: Disk/Harrow on 5/2/14
Herbicides: Post: (5/28/14): 1 pt/ac Atrazine
 3.65 pt/ac Halex GT
 12 oz/ac Roundup PowerMAX
Insecticides/Fungicides: None

Fertilizer: 24 gpa 17-15-0-7 starter at planting
 24-0-0-10 through pivot: 14 gpa on 6/9/14
 UAN 32% through pivot: 14 gpa on 6/19/14
 12 gpa on 7/2/14
 14 gpa on 7/19/14

Irrigation: Pivot – Amounts unknown

Rainfall:



Introduction: This study is looking at the effects of foliar fertilizer on corn yield and concentrations of nutrients in leaf tissue samples. The foliar fertilizer used in this study supplied S, B, Mn, and Zn and was applied at a rate of 1qt/ac aerially on July 10th. Leaf samples were collected from treated and untreated strips approximately 1 month after application and analyzed for nutrient concentrations. Yields were harvested from treated and untreated strips and collected from yield monitor data.

Guaranteed Analysis

Sulfur (S)	3.6%
Boron (B)	0.1%
Manganese (Mn).....	3.0%
Zinc (Zn)	4.0%

Results:

	Yield† (bu/acre)	Net Return ‡
Check	188 A*	\$658.00
Foliar Micronutrient Fertilizer	182 A	\$621.55
<i>P-Value</i>	0.5828	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn, \$23.79/gal foliar micronutrient, and \$9.50/ac aerial application cost.

Summary: At this location, foliar micronutrient treatments were not significantly different than non-treated areas. No soil or tissue sample analysis are available for this site.

Foliar Micronutrient Application to Corn

Study ID: 017003201404

County: Antelope

Soil Type: Thurman and Nora loamy sand

Planting Date: 4/27/2014

Harvest Date: 10/26/2014

Population: 32,000 seeds/acre

Row Spacing: 30"

Hybrid: 213-40 VT3

Reps: 4

Soil Test Values: Manganese: 5 (low), Boron: 0.3 (very low), Zinc: 5.9 (high)

Previous Crop: Corn

Tillage: Disk

Herbicides: Post (5/28/14): 1 pt/acre Atrazine

3.65 pt/acre Halex GT

12 oz/acre Roundup PowerMAX

Insecticides/Fungicides: Brigade 2EC and Headline EC through Pivot on 8/10/14

Soil Test Values:

OM	pH	NO ₃ -N (0-4")	NO ₃ -N (4-8")	P Bray 1	P Bray 2	K	S	Mn	B	Zn
---	---	-----lbs/acre-----		-----ppm-----						
1.3	6.1	6	1	19 (M)	26 (M)	74 (M)	10 (L)	5 (L)	0.3 (VL)	5.9 (H)

*VH=Very High, H=High, M=Medium, L=Low, VL=Very Low

Introduction: This study is looking at the effects of foliar fertilizer on corn yield and concentrations of nutrients in leaf tissue samples. The foliar fertilizer used in this study supplied S, B, Mn, and Zn and was applied at a rate of 2qt/ac aerially on July 10th. Leaf samples were collected from treated and untreated strips approximately 1 month after application and analyzed for nutrient concentrations. Yields were harvested from treated and untreated strips and collected from yield monitor data.

Guaranteed Analysis

Sulfur (S)	3.6%
Boron (B)	0.1%
Manganese (Mn)	3.0%
Zinc (Zn)	4.0%

Fertilizer: 24 gpa 17-15-0-7 starter at planting

24-0-0-10 through pivot: 14 gpa on 6/9/14

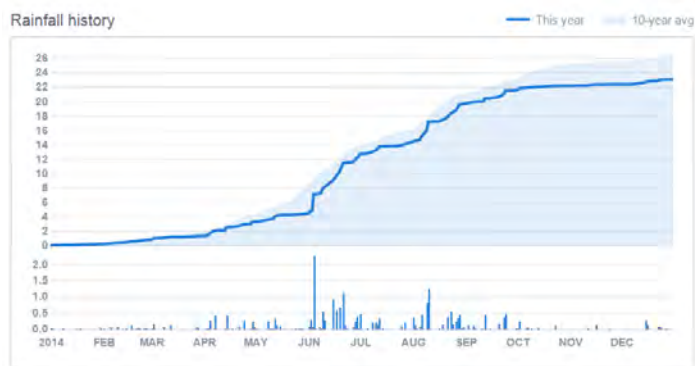
UAN 32% through pivot: 14 gpa on 6/19/14

12 gpa on 7/2/14

14 gpa on 7/19/14

Note: Site was hailed at V3-4

Irrigation: Pivot – amounts unknown



Results:

	Yield†	Plant Tissue Samples							Net Return‡
		N	P	K	S	Mn	B	Zn	
	(bu/acre)	-----(%)-----							
Check	202 A*	2.35 B	0.31 A	1.47 A	0.18 A	57.5 A	6.5 A	25.5 B	\$707.00
Micronutrient	199 A	2.63 A	0.32 A	1.59 A	0.21 A	48.0 A	5.5 A	41.0 A	\$675.10
P-Value	0.7080	0.0454	0.8305	0.1257	0.1257	0.6308	0.7048	0.0614	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn, \$23.79/gal foliar micronutrient, and \$9.50/ac aerial application cost.

Summary: At this location, foliar micronutrient treatments were not significantly different than non-treated areas. We looked at the tissue sample values for the nutrients applied in the foliar treatment. There was no difference in plant tissue samples values for S, Mn, or B; however foliar micronutrient treatments had higher Zn levels in plant tissue than the check.

Combined Analysis of Foliar Micronutrients on Corn

The yields for the three studies using this foliar micronutrient product at a 1 qt/acre rate were combined for analysis. Application date for all studies was July 10, however due to different planting dates it would be expected that growth stage at time of application was not identical for these three studies.

Guaranteed Analysis

Sulfur (S)	3.6%
Boron (B)	0.1%
Manganese (Mn).....	3.0%
Zinc (Zn)	4.0%

Results:

A total of 10 replications were included in these combined results. There was no site by treatment interaction and no treatment effect on yield, however there was a significant site effect (Table 1). Therefore means for yield for the site main effect are shown in Table 2.

Table 1. P-values for site and treatment main effects and site by treatment interaction on yield.

Effect	Pr>F
Site	0.0491
Treatment	0.3990
Site*Treatment	0.2409

Table 2. Means for yield are shown for site (across treatments).

Site number (corresponds to study number)	Yield† (bu/acre)
Site 1: 017003201401	208 A
Site 2: 017003201402	215 A
Site 3: 017003201403	185 B

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

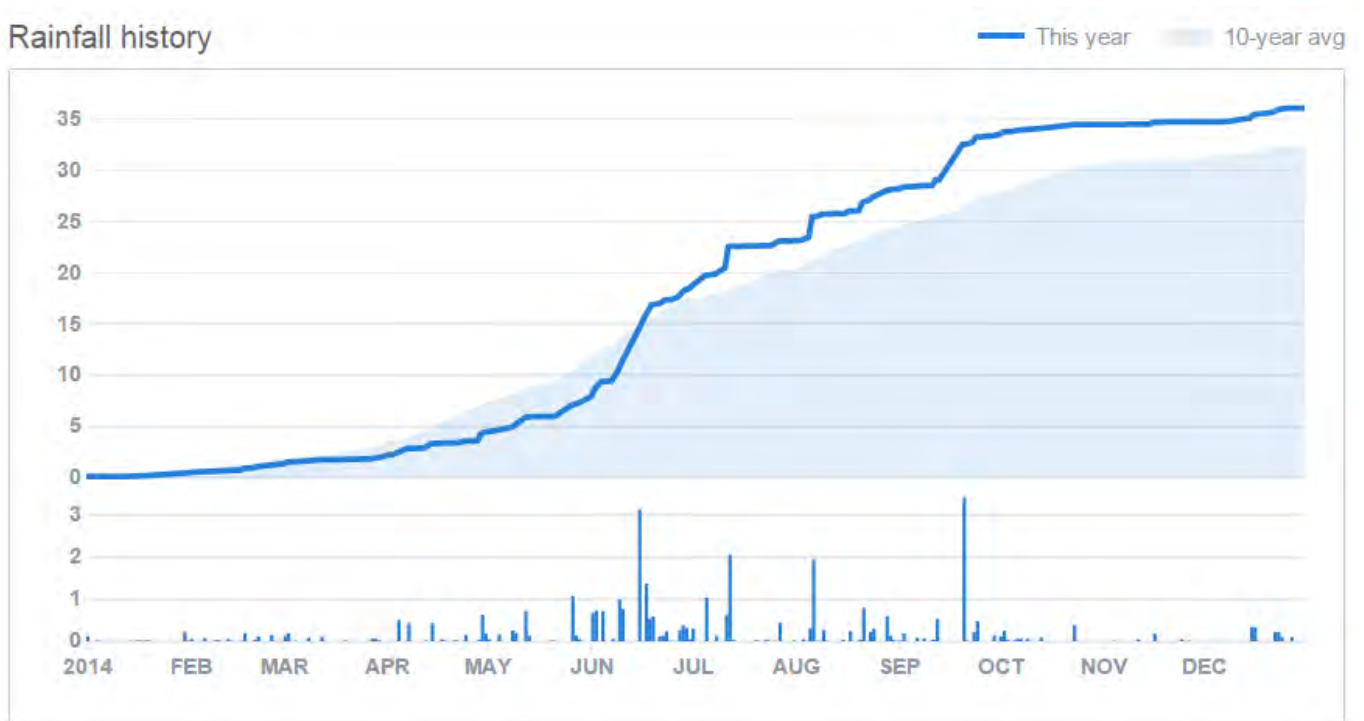
Summary: The three sites had different yields. Across all sites the application of the foliar micronutrient treatment did not result in a significant yield difference when compared to the check. Averaged across sites, the difference between the check and foliar treatment was 4.9 bu/acre with the foliar treatment yielding more than the check, however this was not a statistically significant difference at the 90% confidence level.

Foliar Micronutrient Application to Corn

Study ID: 012027201401
County: Cedar
Soil Type: Crofton and Nora silty clay loam
Planting Date: 5/25/2014
Harvest Date: Unknown
Population: 32,000 seeds/acre
Row Spacing: 20"
Hybrid: P0621 HR
Reps: 10
Irrigation: Pivot – Amounts Unknown

Previous Crop: Soybean
Tillage: No-till
Herbicides: **Pre:** 2 oz. Balance Flexx on 5/16/14
Post: none
Insecticides/Fungicides: Gaucho and Allegiance FL seed treatment
Fertilizer: 40 gal/acre UAN 32% on 5/26/14
 15 gal/acre UAN 32% on 7/25/14

Rainfall history



Soil Test Values:

OM	pH	NO ₃ -N (0-4")	NO ₃ -N (4-8")	P Bray 1	P Bray 2	K	S	Mn	B	Zn
--%---		-----lbs/acre-----		-----ppm-----						
3.3	7.9	8	4	26 (H)	84 (VH)	274 (VH)	13 (M)	5 (L)	0.9 (M)	2 (M)

*VH=Very High, H=High, M=Medium, L=Low, VL=Very Low

Introduction: This study is looking at the effects of foliar fertilizers on corn yield and concentrations of nutrients in leaf tissue samples. Two foliar fertilizers were used in this study. Product 1 (analysis below) was applied at a rate of 1qt/ac and product 2 (analysis below) was applied at a rate of 1pt/ac. Both products were applied with a high clearance applicator on July 3rd. Leaf samples were collected from treated and untreated strips approximately 1 month after application and analyzed for nutrient concentrations. Yields were harvested from treated and untreated strips and collected from yield monitor data.

Product 1:	
Guaranteed Analysis	
Sulfur (S)	3.6%
Boron (B)	0.1%
Manganese (Mn).....	3.0%
Zinc (Zn)	4.0%

Product 2:	
Guaranteed Analysis	
Boron (B)	8%

Results:

	Yield†	Plant Tissue Samples							Net Return‡
		N	P	K	S	Mn	B	Zn	
	(bu/acre)	-----(%)-----					----- (ppm)-----		
Check	202 A*	3.04 A	0.37 A	2.62 A	0.19 A	66.7 A	6.0 A	17.8 A	\$707.00
Foliar Treatment	208 A	3.12 A	0.37 A	2.58 A	0.19 A	68.3 A	5.5 A	18.0 A	\$709.94
P-Value	0.3617	0.2540	0.8302	0.8267	0.7926	0.8222	0.7075	0.7412	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn, \$23.79/gal product 1, \$31.93/gal product 2, and \$8.12 ground applicator cost.

Summary: At this location, the foliar micronutrient treatments did not significantly increase yield when compared to the non-treated areas. We looked at the tissue sample values for the nutrients applied in the foliar treatment (S, Mn, B, and Zn). There was no difference in plant tissue samples values for any of these nutrients.

Foliar Micronutrient Application on Corn

Study ID: 036139201401

County: Pierce

Soil Type: Thurman loamy sand

Planting Date: 4/29/2014

Harvest Date: Unknown

Population: 33,000 seeds/acre

Row Spacing: 30"

Hybrid: Pioneer 1266

Reps: 4

Previous Crop: Soybeans

Tillage: No-till

Herbicides: Pre: 1.5 qt/ac Cinch ATZ Lite 4/30/14

Post: 24 oz/acre Roundup PowerMAX on 5/22/14

2 oz/acre Callisto on 5/22/14

Insecticides/Fungicides: Poncho/VOTiVO and

CruiserMaxx Seed Treatments

Fertilizer:

100 lbs MAP on 4/5/14

75 lbs Potassium chloride on 4/5/14

35 lbs actual N as Ammonium thiosulfate by pivot from

4/30 to 8/20

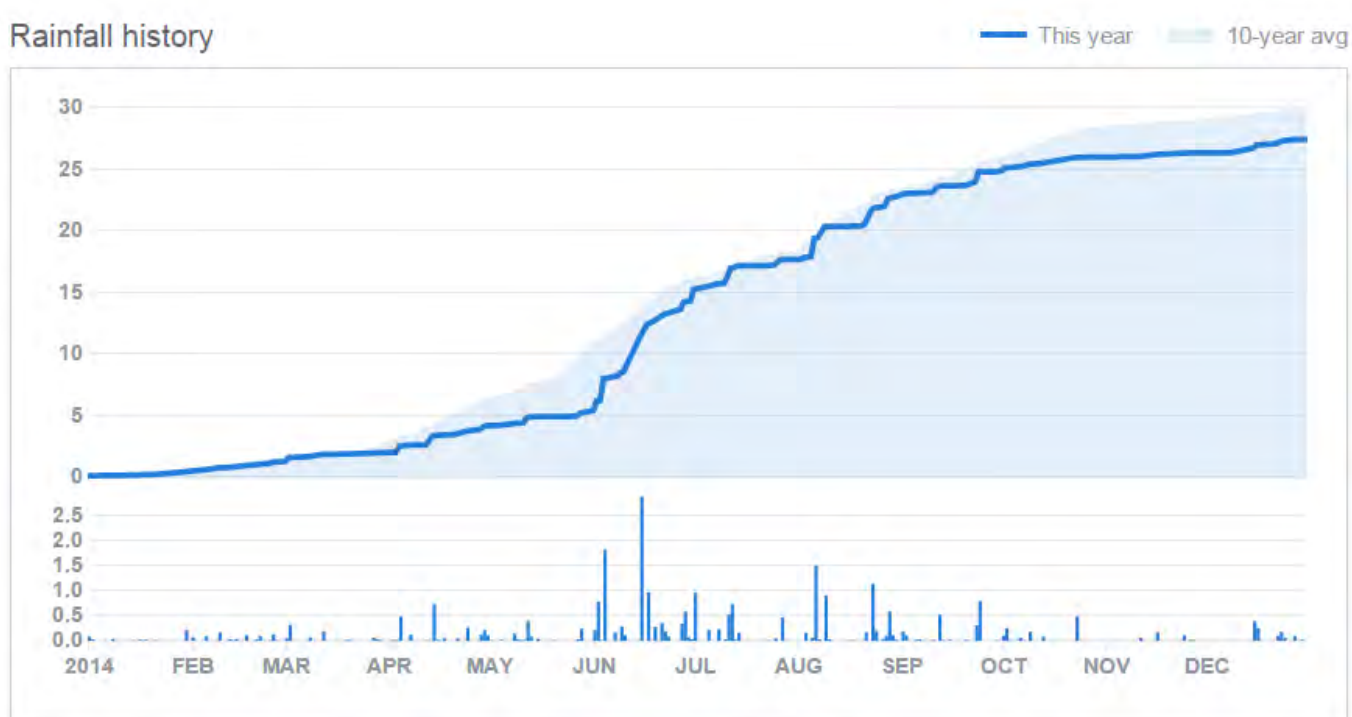
211 lbs actual N as UAN 32% by sprayer and pivot from

4/30 to 8/20

125 lbs 8-20-5-5-0.5 starter on 4/29/14

Irrigation: Pivot – Amounts unknown

Rainfall history



Soil Test Values:

OM	pH	NO ₃ -N (0-4")	NO ₃ -N (4-8")	P Bray 1	P Bray 2	K	Mn	B	Zn
--%--		-----lbs/acre-----		-----ppm-----					
2.6	6.3	8	8	28 (H)	53 (VH)	301 (VH)	7 (L)	0.4 (VL)	2.1 (M)

*VH=Very High, H=High, M=Medium, L=Low, VL=Very Low

Introduction: This study is looking at the effects of foliar fertilizers on corn yield and concentrations of nutrients in leaf tissue samples. Two foliar fertilizers were used in this study. Product 1 (analysis below) was applied at a rate of 1 qt/ac and product 2 (analysis below) was applied at a rate of 1 pt/ac. Both products were applied with a high clearance applicator at V13. Leaf samples were collected from treated and untreated strips approximately 1 month after application and analyzed for nutrient concentrations. Yields were harvested from treated and untreated strips and weighed using a weigh wagon.

Product 1:	
Guaranteed Analysis	
Sulfur (S)	3.6%
Boron (B)	0.1%
Manganese (Mn).....	3.0%
Zinc (Zn)	4.0%

Product 2:	
Guaranteed Analysis	
Boron (B)	8%

Results:

	Yield [†] <i>(bu/acre)</i>	Plant Tissue Samples						Net Return [‡]
		N	P	K	Mn	B	Zn	
		-----(<i>%</i>)-----			-----(<i>ppm</i>)-----			
Check	204 A*	2.73 A	0.34 A	2.58 A	58.75 A	7.75 A	17.75 A	\$714.00
Foliar Treatment	203 A	2.86 A	0.34 A	2.53 A	53.50 A	6.50 A	22.75 A	\$692.44
P-Value	0.7168	0.1717	0.9360	0.6015	0.2774	0.1942	0.1036	--

[†]Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

[‡]Net return based on \$3.50/bu corn, \$23.79/gal product 1, \$31.93/gal product 2, and \$8.12 ground applicator cost.

Summary: At this location, the foliar micronutrient treatments did not result in significantly different yields when compared to the non-treated areas. We looked at the tissue sample values for the nutrients applied in the foliar treatment (S, Mn, B, and Zn). There was no difference in plant tissue samples values for any of these nutrients. The cost of product and application was not recouped.

Foliar Micronutrient Application on Corn

Study ID: 039155201403

County: Saunders

Soil Type: Yutan silty clay loam

Planting Date: 5/16/2014

Harvest Date: 11/13/2014

Population: 37,000

Row Spacing: 30"

Hybrid: Pioneer 1690 HR

Reps: 20

Previous Crop: Soybeans

Tillage: No-till

Irrigation: Pivot irrigated, amounts unknown

Note: Hailed mid-June, 14% damage

Herbicides: Pre: 13 oz/ac Verdict on 5/20/14

22 oz/ac Roundup PowerMAX on 5/20/14

Post: 0.6 oz/ac Armezon on 6/20/14

22 oz/ac Roundup PowerMAX on 6/20/14

Insecticides/Fungicides: Gaucho Seed Treatment

2 oz/ac Baythroid XL on 7/2/14

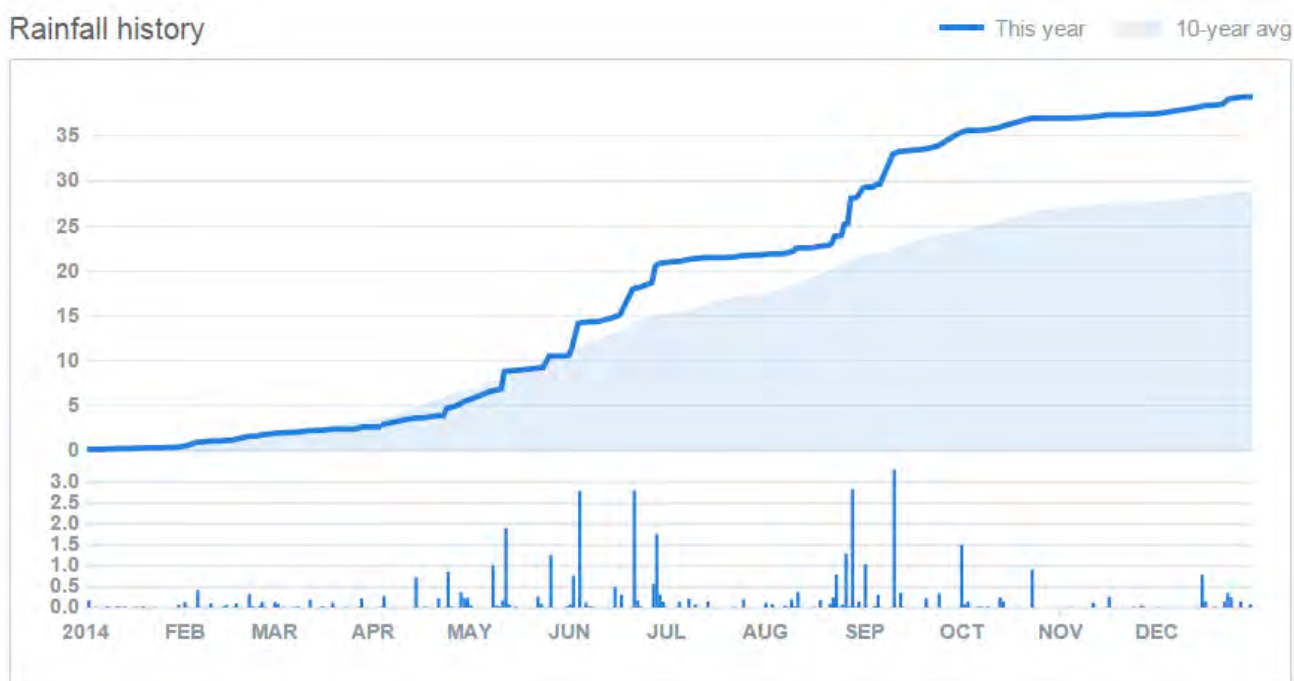
4 oz/ac Priaxor on 7/2/14

10 oz/ac Headline AMP on 8/8/14

Fertilizer: 160# N/acre as anhydrous ammonia, spring

2014. 20 gal/acre of 10-34-0 in furrow 2 x 2 on 5/16/14

Rainfall history



Soil Test Values:

OM	pH	NO ₃ -N (0-4")	NO ₃ -N (4-8")	P Bray 1	P Bray 2	K	S	Mn	B	Zn
-%-		-----lbs/acre-----		-----ppm-----						
2.3	6.0	4	4	24 (H)	43 (H)	219 (VH)	12 (L)	22 (H)	0.5 (L)	1.9 (M)

*VH=Very High, H=High, M=Medium, L=Low, VL=Very Low

Introduction: This study is looking at the effects of foliar fertilizers on corn yield and concentrations of nutrients in leaf tissue samples. Two foliar fertilizers were used in this study. Product 1 (analysis below) was applied at a rate of 1qt/ac and product 2 (analysis below) was applied at a rate of 1pt/ac. Both products were applied with a high clearance applicator on July 2rd. Applied strips were 100' wide and the sprayer only drove through the treated strips. Leaf samples were collected from treated and untreated strips approximately 1 month after application and analyzed for nutrient concentrations. Yields were harvested from treated and untreated strips and weighed using a weigh wagon.

Product 1:	
Guaranteed Analysis	
Sulfur (S)	3.6%
Boron (B)	0.1%
Manganese (Mn).....	3.0%
Zinc (Zn)	4.0%

Product 2:	
Guaranteed Analysis	
Boron (B)	8%

Results:

	Yield†	Plant Tissue Samples							Net Return ‡
		N	P	K	S	Mn	B	Zn	
	(bu/acre)	-----(%)-----			----- (ppm)-----				
Check	249 A*	2.49 A	0.23 A	2.10 A	0.18 A	81.5 A	4.63 A	17.8 B	\$871.50
Foliar Treatment	250 A	2.45 A	0.23 A	2.23 A	0.18 A	90.1 A	4.88 A	22.5 A	\$856.94
P-Value	0.5167	0.5825	0.6491	0.1538	0.1705	0.3590	0.7110	0.0003	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn, \$23.79/gal product 1, \$31.93/gal product 2, and \$8.12 ground applicator cost.

Summary: At this location, the foliar micronutrient treatments did not significantly increase yield when compared to the non-treated areas. We looked at the tissue sample values for the nutrients applied in the foliar treatment (S, Mn, B, and Zn). There was no difference in plant tissue samples values for S, Mn, or B; however, the Max-In Ultra ZMB and Max-In Boron treatment had significantly higher plant tissue Zn levels. The cost of the product and application was not recouped.

Foliar Micronutrient Application on Corn

Study ID: 039155201404

County: Saunders

Soil Type: Yutan silty clay loam

Planting Date: 5/16/2014

Harvest Date: 11/13/2014

Population: 37,000

Row Spacing: 30"

Hybrid: Pioneer 1690 HR

Reps: 20

Soil Test Values: not available

Previous Crop: Soybeans

Tillage: No-till

Herbicides: Pre: 13 oz/ac Verdict on 5/20/14

22 oz/ac Roundup PowerMAX on 5/20/14

Post: 0.6 oz/ac Armezon on 6/20/14

22 oz/ac Roundup PowerMAX on 6/20/14

Insecticides/Fungicides: Gaucho Seed Treatment

2 oz/ac Baythroid XL on 7/2/14

4 oz/ac Priaxor on 7/2/14

10 oz/ac Headline AMP on 8/8/14

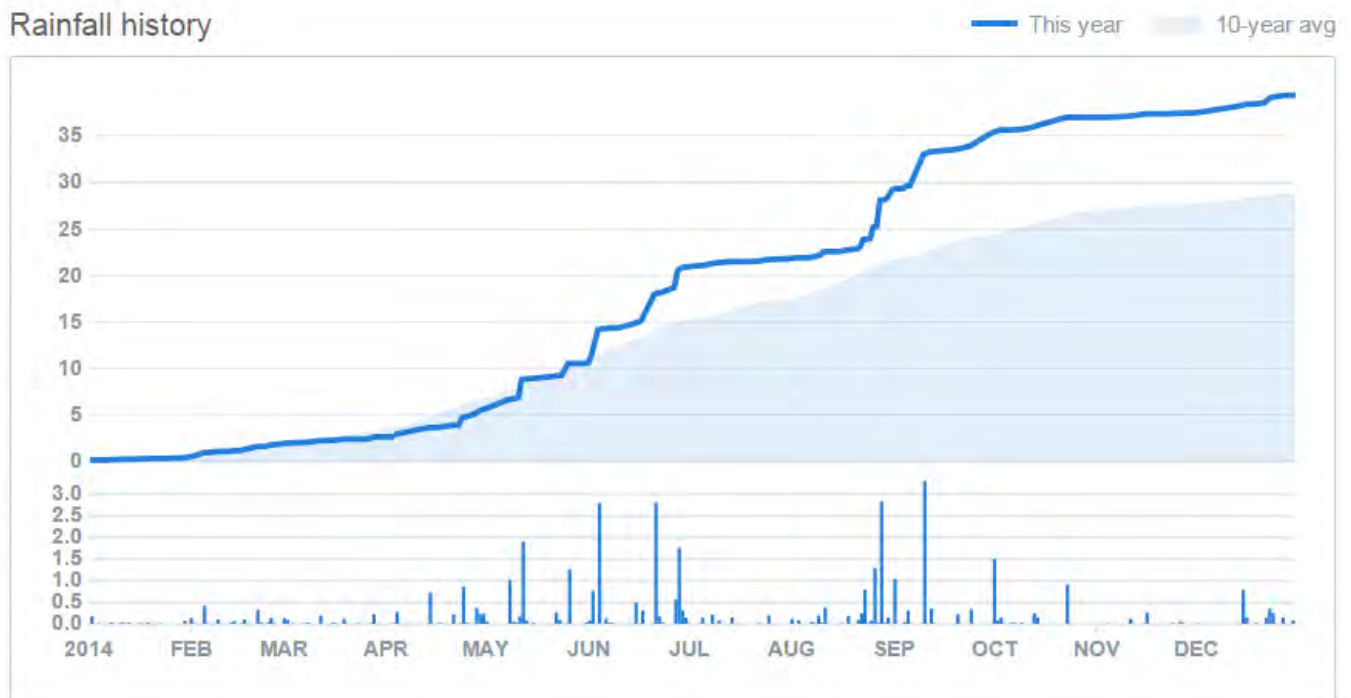
Fertilizer: 160# N/ac as anhydrous ammonia, spring 2014

20 gal/ac of 10-34-0 in furrow 2 x 2 on 5/16/14

Irrigation: Pivot irrigated, amounts unknown

Note: Hailed mid-June, 14% damage

Rainfall history



Introduction: This study is looking at the effects of foliar fertilizers on corn yield and concentrations of nutrients in leaf tissue samples. Two foliar fertilizers were used in this study. Product 1 (analysis below) was applied at a rate of 1 qt/ac and product 2 (analysis below) was applied at a rate of 1 pt/ac. Both products were applied with a high clearance applicator on July 2rd. Applied strips were 100' wide and the sprayer only drove through the treated strips. Leaf samples were collected from treated and untreated strips approximately 1 month after application and analyzed for nutrient concentrations. Yields were harvested from treated and untreated strips and weighed using a weigh wagon.

Product 1:	
Guaranteed Analysis	
Sulfur (S)	3.6%
Boron (B)	0.1%
Manganese (Mn).....	3.0%
Zinc (Zn)	4.0%

Product 2:	
Guaranteed Analysis	
Boron (B)	8%

Results:

	Yield† (bu/acre)	Net Return ‡
Check	248 A*	\$868.00
Foliar Treatment	245 B	\$839.44
P-Value	0.0010	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn, \$23.79/gal product 1, \$31.93/gal product 2, and \$8.12 ground applicator cost.

Summary: At this location, the foliar micronutrient treatments were significantly lower yielding when compared to the non-treated areas. No plant tissue samples or soil test values are available for this site. With lower yields and increased cost of production, the foliar nutrient treatment resulted in a loss of \$28.56/acre at this site.

Combined Analysis of Foliar Micronutrients on Corn

The yields for the four studies using these two foliar micronutrient products were combined for analysis. For all studies, product 1 (analysis below) was applied at 1 qt/ac and product 2 (analysis below) was applied at 1 pt/ac. Products were applied early July.

Product 1:	
Guaranteed Analysis	
Sulfur (S)	3.6%
Boron (B)	0.1%
Manganese (Mn).....	3.0%
Zinc (Zn)	4.0%

Product 2:	
Guaranteed Analysis	
Boron (B)	8%

Results:

A total of 54 replications are included in these combined results. There was no site by treatment interaction and no treatment effect on yield, however there was a significant site effect (Table 1). Therefore means for yield for the site main effect are shown in Table 2.

Table 1. P-values for site and treatment main effects and site by treatment interaction on yield.

Effect	Pr>F
Site	<0.0001
Treatment	0.5910
Site*Treatment	0.1679

Table 2. Means for yield are shown for site (across treatments).

Site number (corresponds to study number)	Yield† (bu/acre)
Site 1: 012027201401	205 C
Site 2: 036139201401	204 C
Site 3: 039155201403	249 A
Site 4: 039155201404	246 B

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

Summary: The four sites had different yields. Across all sites the application of the foliar micronutrient treatment did not result in a significant yield difference when compared to the check. Averaged across sites, the difference between the check and foliar treatment was 0.98 bu/acre with the foliar treatment yielding more than the check, however this was not a statistically significant difference at the 90% confidence level.

Foliar Micronutrient Application on Corn

Study ID: 031099201401

County: Kearney

Soil Type: Holdrege and Detroit silt loam

Planting Date: Unknown

Harvest Date: 10/18/2014

Population: Unknown

Row Spacing: Unknown

Irrigation: Pivot – amount unknown

Hybrid: Unknown

Reps: 8

Previous Crop: Unknown

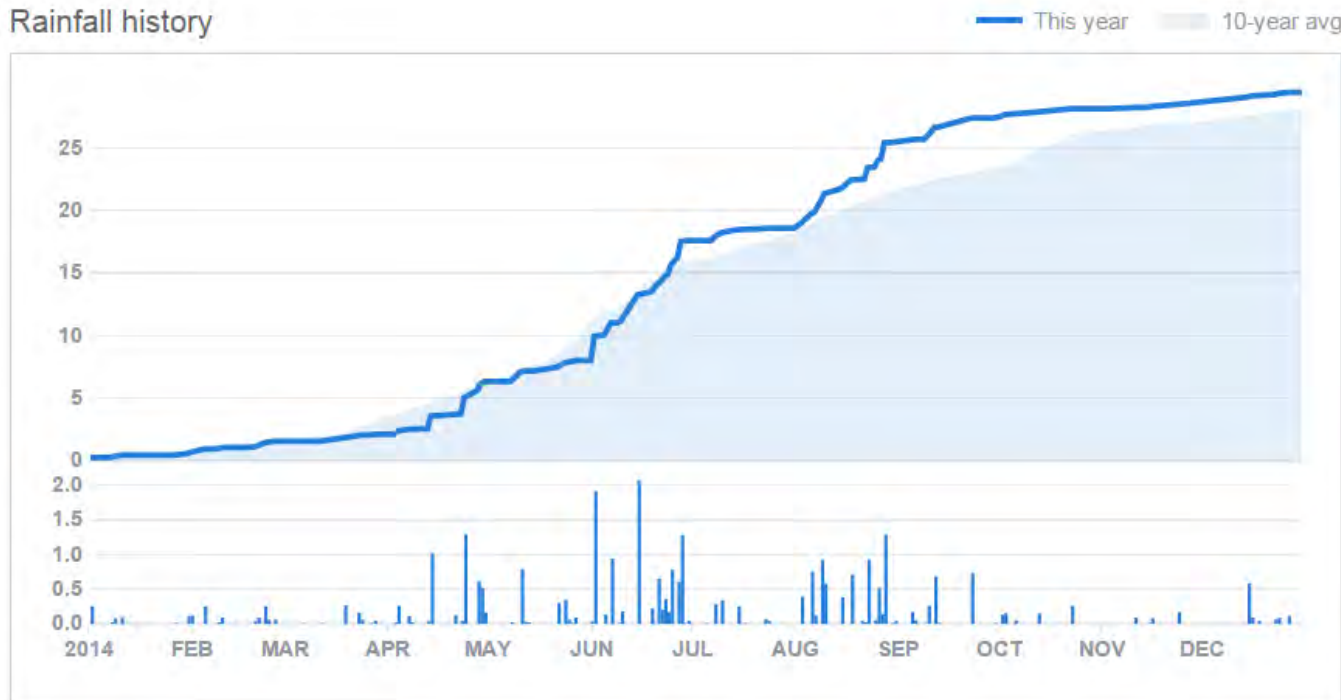
Tillage: Unknown

Herbicides: Pre: Unknown

Post: Unknown

Insecticides/Fungicides: Unknown

Rainfall history



Soil Test Values:

OM	pH	NO ₃ -N (0-4")	NO ₃ -N (4-8")	P Bray 1	P Bray 2	K	S	Fe	Mn	B	Zn
-%--		-----lbs/acre-----		-----ppm-----							
2.2	5.6	42	36	68(VH)	136(VH)	446(VH)	17(M)	42(VH)	17(H)	0.6(L)	1.9(M)

*VH=Very High, H=High, M=Medium, L=Low, VL=Very Low

Introduction: This study is looking at the effects of foliar fertilizers on corn yield and concentrations of nutrients in leaf tissue samples. Two foliar fertilizers were used in this study. Product 1 was applied at a rate of 1 qt/ac and product 2 was applied at a rate of 1 pt/ac. Application was on June 26th with a high clearance applicator. Leaf samples were collected from treated and untreated strips approximately 1 month after application and analyzed for nutrient concentrations. Yields were harvested from treated and untreated strips and weighed using a weigh wagon.

Product 1:	
Guaranteed Analysis	
Total Nitrogen.....	8.00%
Sulfur.....	3.00%
Iron (Fe).....	1.0%
Manganese (Mn).....	2.0%
Zinc (Zn).....	3.0%

Product 2:	
Guaranteed Analysis	
Boron (B)	8%

Results:

	Yield†	Plant Tissue Sampling								Net Return ‡
		N	P	K	S	Fe	Mn	B	Zn	
		------(%)-----				------(ppm)-----				
	<i>bu/ac</i>									
Check	242 A*	2.84 A	0.28 A	2.93 A	0.23 A	141.4 A	108.8 A	9.3 A	23.3 B	\$847.00
Foliar Treatment	233 B	2.85 A	0.28 A	2.94 A	0.22 B	128.3 B	96.4 B	8.5 B	26.6 A	\$797.39
P-Value	0.0560	0.2286	1.000	0.9244	0.0011	0.0448	0.0498	0.0796	0.0205	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn, \$24/gal product 1, \$31.93/gal product 2, and \$8.12 ground applicator cost.

Summary: At this location, the foliar micronutrient treatments was significantly lower in yield when compared to the non-treated areas. We looked at the tissue sample values for the nutrients applied in the foliar treatment (N, S, Fe, Mn, Zn, and B). There was no difference between the foliar applied treatment and the check for N; however, the check had higher S, Fe, Mn, and B levels than the foliar applied treatment. The foliar applied treatment had higher Zn tissue levels than the check. Foliar tissue sample results are inconclusive. The foliar application resulted in a loss of \$49.61/acre due to loss of yield and increased production costs.

Foliar Micronutrient Application on Corn

Study ID: 031099201402

County: Kearney

Soil Type: Holdrege and Detroit silt loam

Planting Date: Unknown

Harvest Date: 10/18/2014

Population: Unknown

Row Spacing: Unknown

Irrigation: pivot – amounts unknown

Hybrid: Unknown

Reps: 8

Previous Crop: Unknown

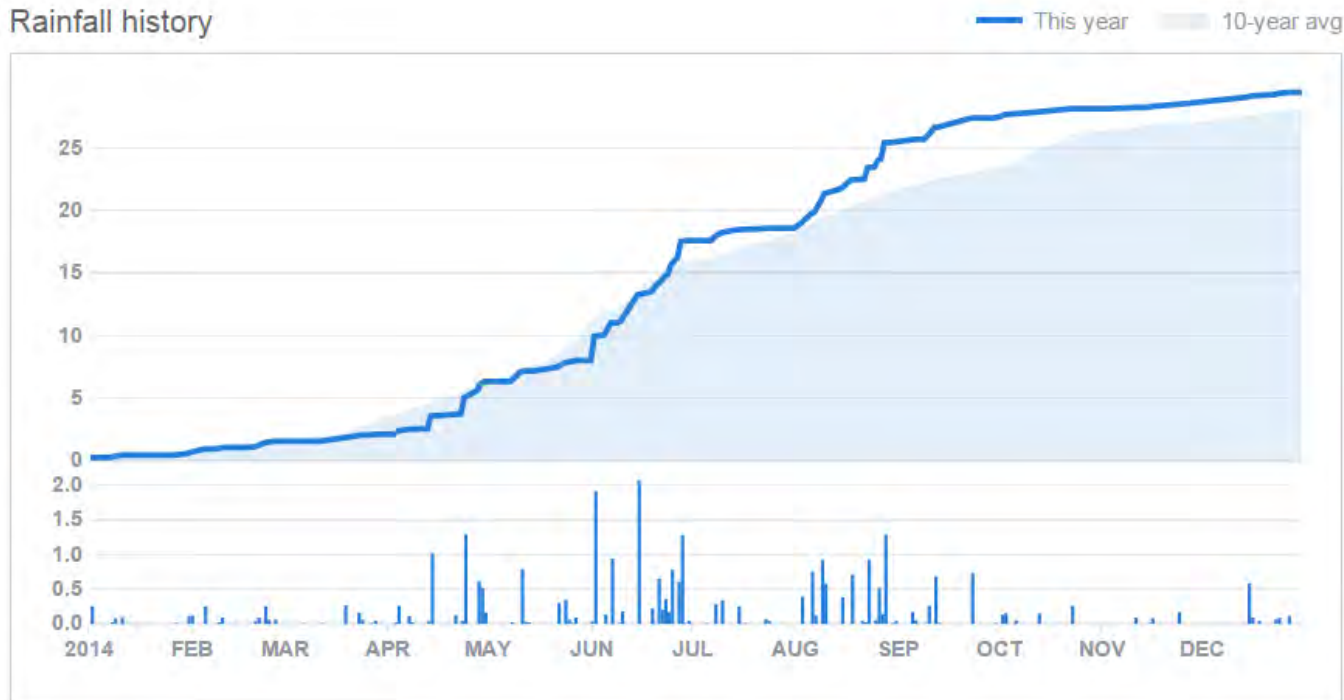
Tillage: Unknown

Herbicides: Pre: Unknown

Post: Unknown

Insecticides/Fungicides: Unknown

Rainfall history



Soil Test Values:

OM	pH	NO ₃ -N (0-4")	NO ₃ -N (4-8")	P Bray 1	P Bray 2	K	S	Fe	Mn	B	Zn
-%		-----lbs/acre----		-----ppm-----							
2.7	6	11	7	110 (VH)	135 (VH)	591 (VH)	14(M)	60(VH)	18 (H)	0.7 (L)	3.3 (H)

*VH=Very High, H=High, M=Medium, L=Low, VL=Very Low

Introduction: This study is looking at the effects of foliar fertilizers on corn yield and concentrations of nutrients in leaf tissue samples. Two foliar fertilizers were used in this study. Product 1 was applied at a rate of 1 qt/ac and product 2 was applied at a rate of 1 pt/ac. Application was on June 26th with a high clearance applicator. Leaf samples were collected from treated and untreated strips approximately 1 month after application and analyzed for nutrient concentrations. Yields were harvested from treated and untreated strips and weighed using a weigh wagon.

Product 1:	
Guaranteed Analysis	
Total Nitrogen.....	8.00%
Sulfur.....	3.00%
Iron (Fe).....	1.0%
Manganese (Mn).....	2.0%
Zinc (Zn).....	3.0%

Product 2:	
Guaranteed Analysis	
Boron (B)	8%

Results:

	Yield†	Plant Tissue Sample							Net Return ‡	
		N	P	K	S	Fe	Mn	B		Zn
	(bu/acre)	-----(%)-----				----- (ppm)-----				
Check	240 A*	2.95 A	0.30 A	3.0 A	0.23 A	122 A	78.0 A	9.67 A	19.2 A	\$840.00
Foliar Treatment	241 A	2.97 A	0.31 A	3.0 A	0.23 A	125 A	67.3 A	9.17 A	21.7 A	\$825.39
P-Value	0.6872	0.9321	0.4327	0.8873	0.8125	0.8373	0.5088	0.6560	0.2322	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn, \$24/gal product 1, \$31.93/gal product 2, and \$8.12 ground applicator cost.

Summary: At this location, the foliar micronutrient treatments were not significantly different in yield when compared to the non-treated areas. We looked at the tissue sample values for the nutrients applied in the foliar treatment (N, S, Fe, Mn, Zn, and B). There was no difference between the foliar applied treatment and the check for any of these nutrients. The cost of the foliar product and application was not recouped.

Combined Analysis of Foliar Micronutrients to Corn

The yields for the two studies using the two foliar micronutrient products below were combined for analysis. For both studies product 1 was applied at 1 qt/ac and product 2 was applied at 1 pt/ac. Application at both sites was on June 26.

Product 1:	
Guaranteed Analysis	
Total Nitrogen.....	8.00%
Sulfur.....	3.00%
Iron (Fe).....	1.0%
Manganese (Mn).....	2.0%
Zinc (Zn).....	3.0%

Product 2:	
Guaranteed Analysis	
Boron (B)	8%

Results:

A total of 16 replications are included in these combined results. There was a site by treatment interactions for yield (Table 1). Means for site and treatment are shown in Table 2.

Table 1. P-values for site and treatment main effects and site by treatment interaction on yield.

Effect	Pr>F
Site	0.3536
Treatment	0.1218
Site*Treatment	0.0521

Table 2. Means for yield and moisture for each site and treatment combination.

Site number (corresponds to study number)	Treatment	Yield† (bu/acre)
Site 1: 031099201401	Check	242 A
Site 1: 031099201401	Foliar	233 B
Site 2: 031099201402	Check	240 AB
Site 2: 031099201402	Foliar	241 A

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

Summary: Yield varied based on site and treatment. The foliar treatment at site 1 was lower yielding than the check treatment at site 1 and foliar treatment at site 2. Averaged across sites, the difference between the check and foliar treatment was 4.03 bu/acre with the check having higher yield than the foliar treatment, however this was not a statistically significant difference at the 90% confidence level.

Foliar Micronutrient Application on Corn

Study ID: 033099201401
County: Kearney
Soil Type: Boel fine sandy loam, Valentine loamy fine sand
Planting Date: Unknown
Harvest Date: 10/21/2014
Population: Unknown
Row Spacing: Unknown
Hybrid: Unknown
Reps: 4
Previous Crop: Unknown
Tillage: Unknown

Herbicides: Pre: Unknown
Post: Unknown
Insecticides/Fungicides: Unknown
Irrigation: Flood irrigated



Soil Test Values:

OM	pH	NO ₃ -N (0-4")	NO ₃ -N (4-8")	P Bray 1	P Bray 2	K	Mn	Zn
---%---		-----lbs/acre-----		-----ppm-----				
1.4	7.6	6	5	74 (VH)	175 (VH)	220 (VH)	3 (VL)	5.2 (H)

*VH=Very High, H=High, M=Medium, L=Low, VL=Very Low

Introduction: This study is looking at the effects of foliar fertilizer on corn yield and concentrations of nutrients in leaf tissue samples. The foliar fertilizer used in this study was applied at a rate of 5 fl oz/ac at V5 on June 12th with a high clearance applicator. Leaf samples were collected from treated and untreated strips approximately 2 months after application and analyzed for nutrient concentrations. Yields were harvested from treated and untreated strips and collected from yield monitor data.

Product:

Guaranteed Analysis

Available Phosphate (P₂O₅).....30.0%
 Water Soluble Manganese (Mn).....8.0%
 8.00% Chelated Manganese (Mn)
 Water Soluble Zinc (Zn).....3.0%
 3.00% Chelated Zinc (Zn)

Results:

	Yield†	Plant Tissue Sample			Net Return ‡
	bu/acre	P	Mn	Zn	
		----%---	-----ppm-----		
Check	258 A*	0.27 A	61.9 A	18.4 A	\$903.00
Foliar	258 A	0.29 A	49.8 B	17.1 A	\$886.66
P-Value	0.6870	0.5027	0.0539	0.2417	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn, \$8.22/acre foliar product, and \$8.12/acre ground applicator cost.

Summary: At this location, the foliar micronutrient treatments were not significantly different in yield when compared to the non-treated areas. We looked at the tissue sample values for the nutrients applied in the foliar treatment (P, Mn, and Zn). There was no difference between the foliar applied treatment and the check for P or Zn; however the check had significantly higher Mn levels than the foliar micronutrient treated area. Overall, with no yield difference, the foliar micronutrient treatment resulted in a loss of \$16.34/acre due to increased production costs.

Foliar Micronutrient Application on Corn

Study ID: 039155201405

County: Saunders

Soil Type: Yutan silty clay loam

Planting Date: 4/19/2014

Harvest Date: 10/21/2014

Population: 31,000 seeds/ac

Row Spacing: 30"

Hybrid: GH 12H71

Reps: 14

Soil Test Values: not available

Previous Crop: Soybeans

Tillage: No-till

Herbicides:

Pre: 2 qt/ac Lexar EZ and 22 oz/ac Roundup PowerMAX on 5/2/14.

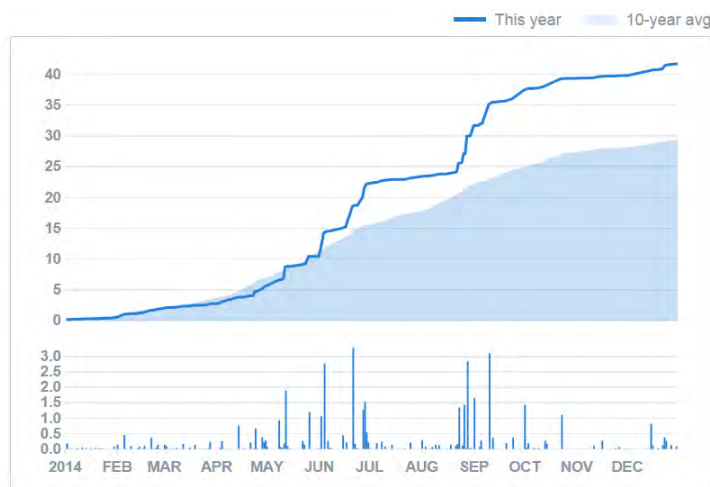
Post: 0.6 oz/ac Armezon and 22 oz/ac Roundup PowerMAX on 6/8/14.

Fertilizer: 160# N/ac as Anhydrous ammonia in Nov. 2013 and 6 gal/ac 10-34-0 in furrow on 4/19/14. 0.5#/ac foliar fertilizer on 6/26/14.

Insecticides/Fungicides: Avicta Complete Corn seed treatment. 2 oz/ac Baythroid XL and 4 oz/ac Priaxor on 6/26/14. 10 oz/ac Headline AMP on 8/19/14.

Irrigation: Not Irrigated

Rainfall:



Introduction: The purpose of this study was to determine if late season micronutrient applications in corn resulted in an increase in grain yield and profit. The product used in this study is shown at right. The product was applied at a rate of 0.5 lb/ac on 7/2/14.



BMZ
SOLUBLE MICROGRANULES

GUARANTEED ANALYSIS

Boron (B) 0.9 %
Manganese (Mn) 4.5 %
4.5 % Chelated Manganese (Mn)
Molybdenum (Mo) 0.5 %
Zinc (Zn) 10.0 %
10.0 % Chelated Zinc (Zn)

Derived from: Boric Acid, Manganese EDTA, Sodium Molybdate, Zinc EDTA

Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Check	211 A*	15.2% B	\$738.50
Foliar micronutrient	210 A	15.9% A	\$726.00
P-Value	0.6407	0.0001	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn and \$12/ac combined product and application cost.

Summary: The treatment of the foliar micronutrient did not result in a significant difference in yield. There was a significant difference in moisture content between the treatment and the check. There was a lower net return from the treatment due to higher production cost.

Foliar Micronutrient Application on Corn

Study ID: 039155201406

County: Saunders

Soil Type: Yutan silty clay loam

Planting Date: 4/19/2014

Harvest Date: 10/28/2014

Population: 31,000 seeds/ac

Row Spacing: 30"

Hybrid: GH 12H71

Reps: 15

Soil Test Values: not available

Previous Crop: Soybeans

Tillage: No-till

Herbicides:

Pre: 2 qt/ac Lexar EZ and 22 oz/ac Roundup PowerMAX on 5/2/14.

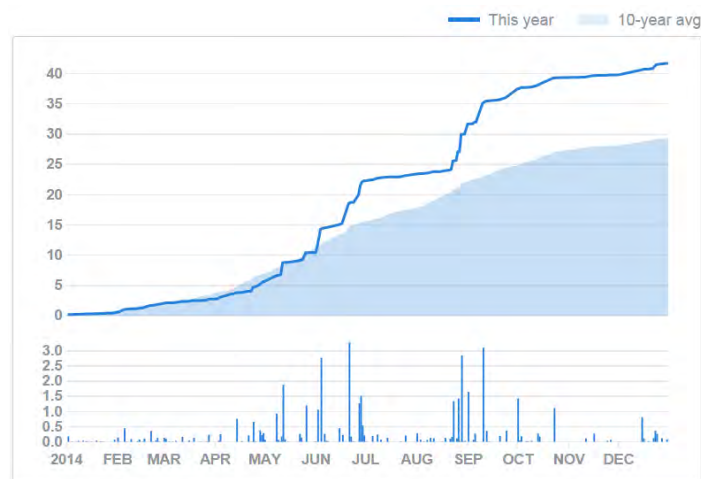
Post: 0.6 oz/ac Armezon and 22 oz/ac Roundup PowerMAX on 6/8/14.

Fertilizer: 160# N/ac as Anhydrous ammonia in Nov. 2013 and 6 gal/ac 10-34-0 in furrow at planting. 0.5#/ac foliar fertilizer on 6/26/14.

Insecticides/Fungicides: Avicta Complete Corn seed treatment. 2 oz/ac Baythroid XL and 4 oz/ac Priaxor on 6/26/14. 10 oz/ac Headline AMP on 8/19/14.

Irrigation: Not irrigated

Rainfall:



Introduction: The purpose of this study was to determine if late season micronutrient applications in corn resulted in an increase in grain yield and profit. The product used in this study is shown at right. The product was applied at a rate of 0.5 lb/ac on 7/2/14.



BMZ 98F02044A1
SOLUBLE MICROGRANULES

GUARANTEED ANALYSIS	
Boron (B)	0.9%
Manganese (Mn)	4.5%
4.5% Chelated Manganese (Mn)	
Molybdenum (Mo)	0.5%
Zinc (Zn)	10.0%
10.0% Chelated Zinc (Zn)	
Derived from: Boric Acid, Manganese EDTA, Sodium Molybdate, Zinc EDTA	

Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Check	219 A*	15.2% A	\$766.50
Foliar micronutrient	219 A	15.3% A	\$754.50
P-Value	0.9627	0.7635	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn and \$12/ac combined product and application cost.

Summary: There were no significant differences in yield or moisture content between the treatment and the check. The treatment gave a lower net return due to un-recovered production costs.

Foliar Micronutrient Application on Corn

Study ID: 039155201407

County: Saunders

Soil Type: Ytan silty clay loam, Tomek and Filbert silt loam

Planting Date: 4/25/2014

Harvest Date: 10/31/2014

Population: 31,000 seeds/ac

Row Spacing: 30"

Hybrid: GH 12H71

Reps: 20

Soil Test Values: not available

Previous Crop: Soybeans

Tillage: No-till

Herbicides:

Pre: 2 qt/ac Lexar EZ and 22 oz/ac Roundup PowerMAX on 5/3/14

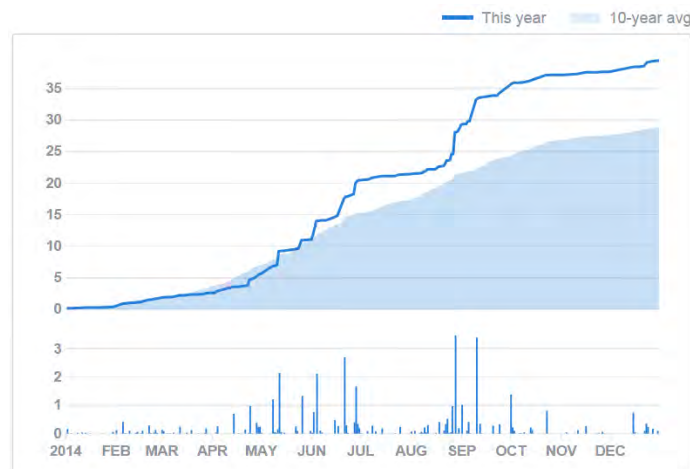
Post: 0.6 oz/ac Armezon and 22 oz/ac Roundup PowerMAX on 6/6/14

Insecticides/Fungicides: Avicta Complete Corn seed treatment. 2 oz/ac Baythroid XL and 4 oz/ac Priaxor on 6/26/14. 10 oz/ac Headline AMP on 8/19/14.

Fertilizer: 160# N/ac as Anhydrous ammonia in Nov. 2013 and 5 gal/ac 10-34-0 in furrow at planting. 0.5#/ac foliar fertilizer on 6/26/14

Irrigation: Not irrigated

Rainfall:



Introduction: The purpose of this study was to determine if late season micronutrient applications in corn resulted in an increase in grain yield and profit. The product used in this study is shown at right. The product was applied at a rate of 0.5 lb/ac on 7/2/14.



BMZ
SOLUBLE MICROGRANULES

98102044A1

GUARANTEED ANALYSIS

Boron (B)	0.9%
Manganese (Mn)	4.5%
4.5% Chelated Manganese (Mn)	
Molybdenum (Mo)	0.5%
Zinc (Zn)	10.0%
10.0% Chelated Zinc (Zn)	

Derived from: Boric Acid, Manganese EDTA, Sodium Molybdate, Zinc EDTA

Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Check	227 A*	16.7% B	\$794.50
Foliar micronutrient	228 A	17.2% A	\$786.00
P-Value	0.2999	0.0001	--

†Bushels per acre corrected to 15.5% moisture.

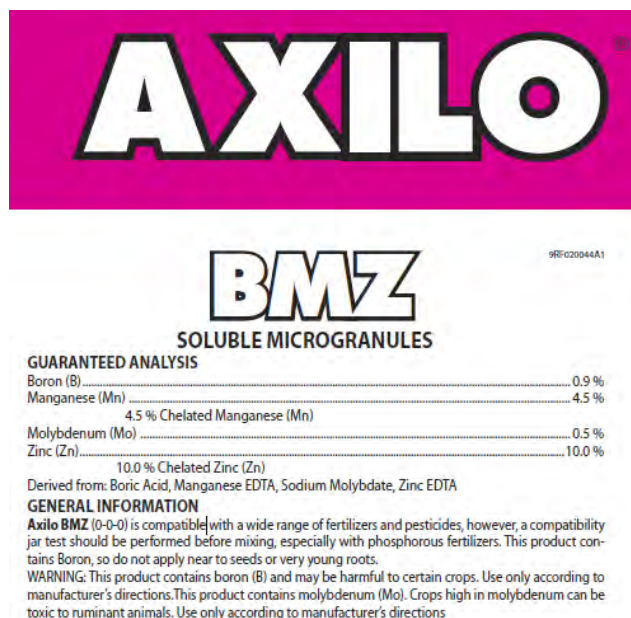
*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn and \$12/ac combined product and application cost.

Summary: There was no significant difference in yield between the treatment and the check. The moisture content for the treatment was significantly higher than the check. There was lower net return for the treatment due to un-recovered production costs.

Combined Analysis of Foliar Micronutrient Helena BMZ Product to Corn

The yields for the three studies using the foliar micronutrient product below were combined for analysis. The product was applied at 0.5 lb/ac on 7/2/14. The purpose of this study was to determine if late season micronutrient applications in corn resulted in an increase in grain yield and profit.



Results:

A total of 49 replications are included in this combined analysis. There was no site by treatment interaction and no treatment effect on yield, however there was a significant site effect (Table 1). Therefore means for yield for the site main effect are shown in Table 2.

Table 1. P-values for site and treatment main effects and site by treatment interaction on yield.

Effect	Pr>F
Site	<0.0001
Treatment	0.8567
Site*Treatment	0.6563

Table 2. Means for yield are shown for site (across treatments).

Site number (corresponds to study number)	Yield† (bu/acre)	Moisture
Site 1: 039155201405	211 C	15.6 B
Site 2: 039155201406	219 B	15.3 C
Site 3: 039155201407	227 A	17.0 A

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

Summary: The three sites had different yields. Across all sites the application of the foliar micronutrient treatment did not result in a significant yield difference when compared to the check. Averaged across sites, the difference between the check and foliar treatment was 0.15 bu/acre with the check treatment yielding more than the foliar, however this was not a statistically significant difference at the 90% confidence level.

Foliar Micronutrient Application to Soybean

Study ID: 013073201401

County: Gosper

Soil Type: Holdrege Silt Loam

Planting Date: Unknown

Harvest Date: Unknown

Population: Unknown

Row Spacing: Unknown

Hybrid: Golden Harvest 28U7

Soil Test Values: Not available

Irrigation: Pivot – Amounts unknown.

Reps: 4

Previous Crop: Corn

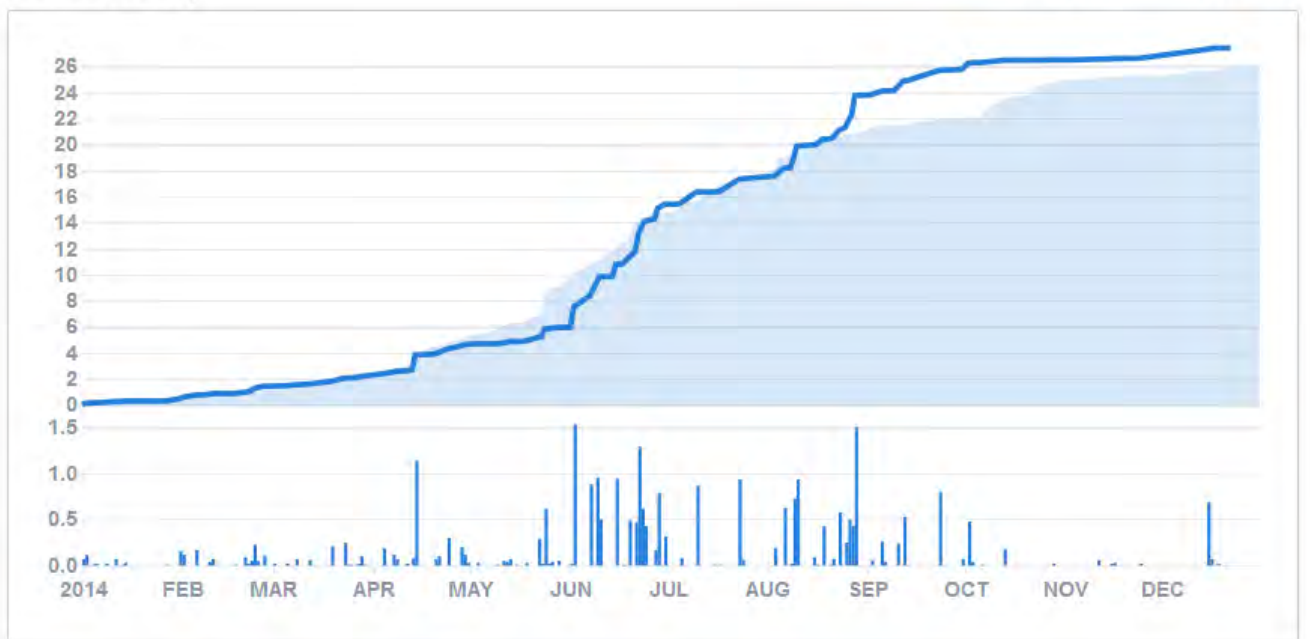
Tillage: No-till

Herbicides: Pre: 3 oz/ac Zidua broadcast

Insecticides/Fungicides: Poncho/VOTIVO and
CruiserMaxx Plus seed treatments

Fertilizer: MAP Variable Rate in January

Rainfall history



Introduction: This study is looking at the effects of foliar fertilizers on soybean yield and concentrations of nutrients in leaf tissue samples. Two foliar fertilizers were used in this study. Product 1 was applied at a rate of 1 qt/ac and Product 2 was applied at a rate of 1 pt/ac. Application was at R1 on July 2nd with a high clearance applicator. Leaf samples were collected from treated and untreated strips approximately 1 month after application and analyzed for nutrient concentrations. Yields were harvested from treated and untreated strips and collected from yield monitor data.

Product 1:	
Guaranteed Analysis	
Total Nitrogen.....	8.00%
Sulfur.....	3.00%
Iron (Fe).....	1.0%
Manganese (Mn).....	2.0%
Zinc (Zn).....	3.0%

Product 2:	
Guaranteed Analysis	
Boron (B)	8%

Results:

	Yield†	Plant Tissue Samples								Net Return‡
		N	P	K	S	Fe	Mn	B	Zn	
	(bu/ac)	------(%)-----			------(ppm)-----					
Check	72 A*	6.21 A	0.37 A	2.11 A	0.36 A	134.9 A	144.1 A	49.1 A	32.9 A	\$720.00
Foliar	74 A	6.10 A	0.37 A	2.17 A	0.36 A	133.5 A	148.0 A	49.3 A	33.4 A	\$721.89
Treatment										
P-Value	0.1496	0.3589	0.6952	0.5591	0.8952	0.8482	0.6654	0.9601	0.6725	--

†Bushels per acre corrected to 13% moisture.

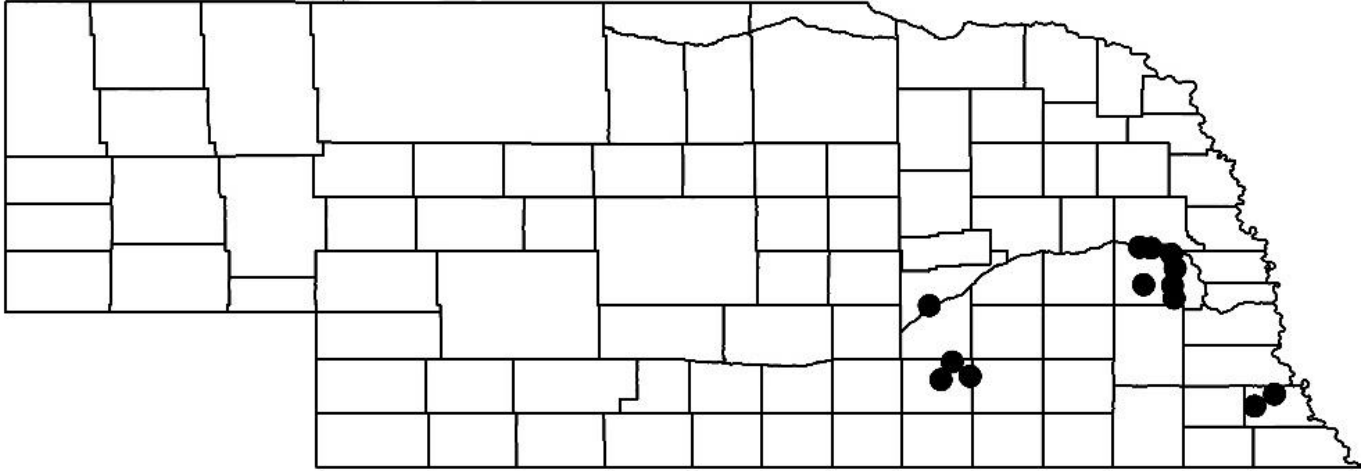
*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$10.00/bu soybeans, \$24/gal product 1, \$31.93/gal product 2, and \$8.12 ground applicator cost.

Summary: At this location, the foliar micronutrient treatments were not significantly different in yield when compared to the non-treated areas. We looked at the tissue sample values for the nutrients applied in the foliar treatment (N, S, Fe, Mn, Zn, and B). There was no difference between the foliar applied treatment and the check for any of these nutrients.

Other Nutrient Studies

Other Nutrient Study Locations:



Micronutrient Application on Corn

Study ID: 034023201401

County: Butler

Soil Type: Hastings Silt Loam

Planting Date: 4/28/2014

Harvest Date: 11/6/2014

Population: 32,000 seeds/acre

Row Spacing: 36"

Hybrid: G12H71 3000 GT

Reps: 6

Previous Crop: Soybeans

Tillage: Ridge Till

Herbicides: Pre: 0.7 qt/ac Bicep II Magnum FC and 1 oz/ac Balance Flexx on 4/28/14.

Post: 26 oz/ac Roundup PowerMAX on 5/26/14

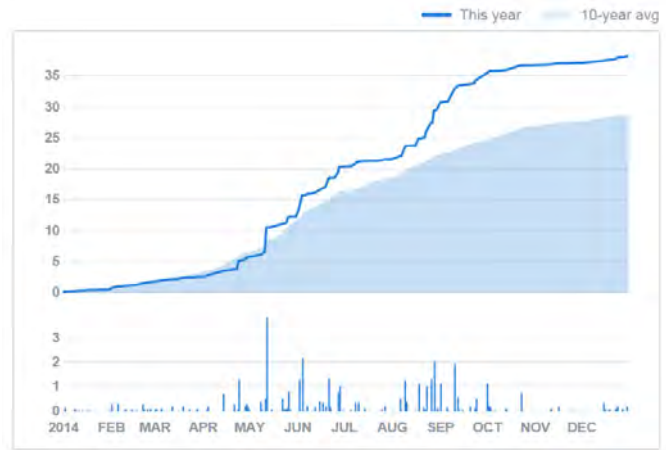
Insecticides/Fungicides: Avicta Complete Corn Seed Treatment

Fertilizer: 180 lbs/acre anhydrous ammonia on 3/2014

100 lbs/acre ammonium sulfate topdress on 5/24/14 **Irrigation:**

Furrow 9"

Rainfall:



Soil Test Values:

Sample ID	Soil pH	Modified WDRF BpH	Soluble Salts 1:1 mmho/cm	Excess Lime Rating	Organic Matter LOI-%	FIA Nitrate ppm N	Depth Nitrate Lbs N/A	Method Phosphorus ppm P	-Ammonium Acetate-				Ca-P Sulfate ppm SDTPA.....				Sum of Cations me/100g	% Base Saturation					
Lab No.	1:1								K ppm	Ca ppm	Mg ppm	Na ppm		Zn ppm	Fe ppm	Mn ppm	Cu ppm		H	K	Ca	Mg	Na	
CNP1						0 - 8 in	M-P3																	
47347	6.6		0.29	NONE	2.6	6.2	15	59	448	2631	275	30	13	4.84	30	8.6	0.88	16.7	0	7	78	14	1	

Figure 1: Composite sample of entire 40 acres pre-plant.

Introduction: The objective of this study was to look at the effect of a “Kitchen Sink” treatment on yield and economics. The Kitchen Sink treatment consisted of 150 lbs of a mix containing 15% gypsum, 55% Micro-Pack (guaranteed analysis at right), and 30% MAP. Average soil test pH for the field including the plot was 6.6 and phosphorus was 59 ppm which is considered very high according to UNL soil test recommendations (Figure 1). The cost of the treatment was \$60/acre. 180lbs of anhydrous ammonia was applied in March of 2014. Shortly after, the kitchen sink treatment was applied. The treatments were separated physically; the anhydrous knife runs in between the rows and the dry applicator is into the side of the ridge so there would normally be 12-15 inches separating the bands. Soil samples were taken between planting and harvest in both the check and Kitchen Sink treatments (Figure 2).



Guaranteed Analysis

Nitrogen (N)	5%
Phosphate (P ₂ O ₅).....	5%
Potash (K ₂ O).....	5%
Calcium (Ca).....	4%
Magnesium (Mg).....	2.5%
Sulfur (S).....	12%
Boron (B).....	1.5%
Copper (Cu).....	1%
Iron (Fe).....	1%
Manganese (Mn).....	1.5%
Zinc (Zn).....	2%

SOIL ANALYSIS REPORT																
SAMPLE IDENTIFICATION	ORGANIC MATTER LOI percent RATE	PHOSPHORUS			NEUTRAL AMMONIUM ACETATE (EXCHANGEABLE)				pH		CATION EXCHANGE CAPACITY C.E.C. meq/100g	PERCENT BASE SATURATION (COMPUTED)				
		P ₁ WEAK BRAY 1-7 ppm RATE	P ₂ STRONG BRAY 1-7 ppm RATE	OLSEN BICARBONATE P ppm RATE	POTASSIUM K ppm RATE	MAGNESIUM Mg ppm RATE	CALCIUM Ca ppm RATE	SODIUM Na ppm RATE	SOIL pH 1-1	BUFFER INDEX		% K	% Mg	% Ca	% H	% Na
		MTS 1A	3.0 M	62 VH	79 VH		414 VH	240 H	2232 H	49		6.4	6.8	15.8	6.7	12.7
MTS 1B	2.7 M	41 VH	85 VH		458 VH	374 VH	2723 H	46	6.5	6.8	19.6	6.0	15.9	69.5	7.6	1.0
MTS 2A	2.8 M	39 VH	44 H		395 VH	321 VH	2799 H	51	6.7		17.9	5.7	14.9	78.2	0.0	1.2
MTS 2B	2.3 L	46 VH	91 VH		455 VH	356 VH	2763 H	40	6.6	6.8	19.3	6.0	15.4	71.6	6.1	0.9
MTS 3A	2.5 L	32 VH	45 H		345 VH	377 VH	3053 H	52	6.8		19.5	4.5	16.1	78.2	0.0	1.2
MTS 3B	2.7 M	34 VH	49 H		411 VH	355 VH	2648 H	35	6.4	6.7	19.1	5.5	15.5	69.3	8.9	0.8
MTS 4B	2.6 M	35 VH	47 H		373 VH	330 VH	2380 M	36	6.0	6.6	18.6	5.1	14.8	64.0	15.3	0.8
MTS 5B	2.7 M	29 H	43 H		408 VH	381 VH	2884 H	40	6.3	6.7	21.0	5.0	15.1	68.7	10.4	0.8
MTS 6B	2.6 M	39 VH	52 H		459 VH	300 VH	2513 H	59	6.3	6.7	18.4	6.4	13.6	68.3	10.3	1.4

NITRATE-N (FIA)										SULFUR S ICAP ppm RATE	ZINC Zn DTFA ppm RATE	MANGANESE Mn DTFA ppm RATE	IRON Fe DTFA ppm RATE	COPPER Cu DTFA ppm RATE	BORON B SOIL DTFA ppm RATE	EXCEL LINE RATE	SOLUBLE SALTS 1-1 mmhos/cm RATE
SURFACE			SURSOIL 1			SURSOIL 2			Total lb/A								
ppm	lb/A	depth (in)	ppm	lb/A	depth (in)	ppm	lb/A	depth (in)									
24	43	0-6							43	21 H	5.6 H	7 L	32 VH	0.8 L	0.6 L	L	0.4 L
17	31	0-6							31	15 M	3.4 H	6 L	34 VH	0.9 M	0.6 L	L	0.4 L
23	41	0-6							41	19 H	3.0 M	6 L	33 VH	0.8 L	0.7 L	L	0.4 L
15	27	0-6							27	16 M	3.1 H	6 L	29 VH	0.8 L	0.6 L	L	0.3 L
18	32	0-6							32	13 M	2.5 M	4 VL	29 VH	0.8 L	0.6 L	L	0.4 L
15	27	0-6							27	16 M	2.6 M	7 L	49 VH	0.9 M	0.6 L	L	0.3 L
18	32	0-6							32	18 M	3.2 H	9 M	42 VH	0.8 L	1.2 M	L	0.3 L
19	34	0-6							34	19 H	3.3 H	8 L	39 VH	0.9 M	0.7 L	L	0.4 L
25	45	0-6							45	32 VH	4.0 H	8 L	31 VH	0.7 L	0.6 L	L	0.4 L

Figure 2: Soil sample corresponding to treatment strips in the field. Odd numbers are where “Kitchen Sink” treatment strips are located and even numbers are the check. The “A” and “B” delineate each end of the field-length strip.

Results:

	Yield† (bu/acre)	Moisture (%)	Test Weight (lb/bu)	Harvest Pop (plants/ac)	Stalk Rot (%)	Net Return ‡
Check	239 B*	14.7% B	58.5 A	30,417 A	20.5% B	\$836.50
‘Kitchen Sink’ Micronutrients	245 A	15.1% A	58.4 A	31,000 A	37.3% A	\$797.50
P-Value	<i>0.0039</i>	<i>0.0058</i>	<i>0.6320</i>	<i>0.3522</i>	<i>0.0103</i>	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn price and “Kitchen Sink” treatment cost \$60/ac.

Summary: Results showed a statistically significant yield increase due to the Kitchen Sink treatment compared to the check, a significant difference in percent moisture at harvest (+0.5%), and a significant increase in stalk rot compared to the check. There were no statistical differences in stand count or test weight. Despite the increase in yield, the application of the “Kitchen Sink” treatment did not result in an increase in net return due to the cost of the products.

Pentilex™ AQUA Seed Germination Aid Treatment on Corn

Study ID: 039155201409

County: Saunders

Soil Type: Yutan silty clay loam

Planting Date: 4/22/2014

Harvest Date: 10/27/2014

Population: 37,000 seeds/ac

Row Spacing: 30"

Hybrid: DKC 62-97

Reps: 20

Soil Test Values:

Previous Crop: Soybeans

Tillage: No-till

Herbicides:

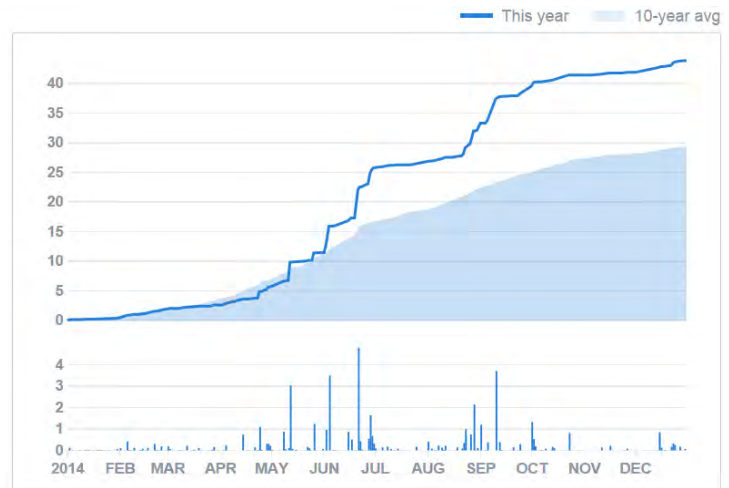
Pre: 13 oz/ac Verdict and 22 oz/ac Roundup PowerMAX on 4/28/14.

Post: 0.6 oz/ac Armezon and 22 oz/ac Roundup Power MAX on 6/10/14.

Insecticides/Fungicides: A250 seed treatment. 2 oz/ac Baythroid XL and 4 oz/ac Priaxor on 6/28/14. 10 oz/ac Headline AMP on 8/1/14.

Fertilizer: 160# N/ac as Anhydrous ammonia in Nov. 2013 and 6 ga/ac 10-34-0 in furrow at planting on 4/22/14 **Irrigation:** Pivot irrigated, amounts unknown.

Rainfall:



Introduction: The purpose of this study was to evaluate the performance of a germination aid product which is suggested to increase the seeds' high internal energy components. This improves germination potential and seeding vigor, resulting in uniform plant emergence. The grower was interested to see if it increased corn yield. The product Pentilex™ AQUA was applied to the seed before planting. The product label and guaranteed analysis is shown at right.



Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Check	276 A*	18.0 A	\$966.00
Pentalix™ AQUA	275 A	18.0 A	\$956.00
P-Value	0.7298	0.8448	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

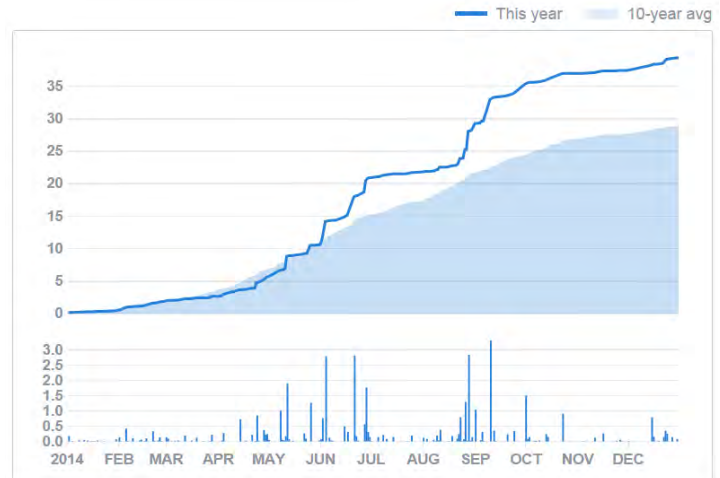
‡Net return based on \$3.50/bu corn and \$6.50/acre for Pentilex™ AQUA.

Summary: The application of the germination aid did not result in an increase in corn yield. The increased cost of production was not recovered resulting in lower net returns for the Petalix™ AQUA treatment.

Pentilex™ AQUA Seed Germination Aid Treatment on Corn

Study ID: 039155201410
County: Saunders
Soil Type: Yutan silty clay loam
Planting Date: 4/22/2014
Harvest Date: 10/27/2014
Population: 37,000 seeds/ac
Row Spacing: 30"
Hybrid: DKC 62-97
Reps: 20
Soil Test Values:
Previous Crop: Soybeans
Tillage: No-till
Herbicides: Pre: 13 oz/ac Verdict and 22 oz/ac Roundup PowerMAX on 5/3/14.
 Post: 0.6 oz/ac Armezon and 22 oz/ac Roundup PowerMAX on 6/11/14.
Insecticides/Fungicides: A250 seed treatment.
 2 oz/ac Baythroid XL and 4 oz/ac Priaxor on 6/28/14. 10 oz/ac Headline AMP on 8/1/14.

Fertilizer: 160# N/ac as Anhydrous ammonia in Nov. 2013 and 6 gal/ac 10-34-0 in furrow at planting on 4/22/14
Irrigation: Pivot irrigated, amount unknown
Rainfall:



Introduction: The purpose of this study was to evaluate the performance of a germination aid product which is suggested to increase the seeds' high internal energy components. This improves germination potential and seeding vigor, resulting in uniform plant emergence. The grower was interested to see if it increased corn yield. The product Pentilex™ AQUA was applied to the seed before planting. The product label and guaranteed analysis is shown at right.



Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Check	266 A	17.5 A	\$931.00
Pentilex™ AQUA	264 A	17.6 A	\$917.50
<i>P-Value</i>	<i>0.3060</i>	<i>0.6051</i>	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn and \$6.50/acre for Pentilex™ AQUA.

Summary: The application of the germination aid did not result in an increase in corn yield. The increased cost of production was not recovered resulting in lower net returns for the Pentilex™ AQUA treatment.

Combined Analysis of Pentilex™ AQUA Seed Germination Aid Treatment on Corn

Two fields in Saunders County tested the seed germination aid Pentilex™ AQUA. Both fields were center pivot irrigated. The product was applied to the seed prior to planting. The product label and guaranteed analysis are shown below.



Results: A total of 40 replications are included in the combined analysis shown below. There was no site by treatment interaction and no treatment effect on yield, however there was a significant site effect (Table 1). Therefore means for yield for the site main effect are shown in Table 2.

Table 1. P-values for site and treatment main effects and site by treatment interaction on yield.

Effect	Pr>F
Site	<0.0001
Treatment	0.2831
Site*Treatment	0.4605

Table 2. Means for yield are shown for site (across treatments).

Site number (corresponds to study number)	Yield† (bu/acre)	Moisture
Site 1: 039155201409	276 A	18.0 A
Site 2: 039155201410	265 B	17.5 B

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

Summary: The two sites had different yields. Across all sites the application of the foliar micronutrient treatment did not result in a significant yield difference when compared to the check. Averaged across sites, the difference between the check and foliar treatment was 0.92 bu/acre with the check treatment yielding more than the Pentilex™ AQUA treatment, however this was not a statistically significant difference at the 90% confidence level.

Calcium Sulfate on Rainfed Corn

Study ID: 016155201401

County: Saunders

Soil Type: Yutan silty clay loam, eroded

Planting Date: 5/3/2014

Harvest Date: 10/30/2014

Population: 25,671 seeds/acre

Row Spacing: 30"

Hybrid: LG 2636

Reps: 4

Previous Crop: Soybeans

Tillage: No-Till

Herbicides: Pre: 2.5 pt/ac TripleFLEX on

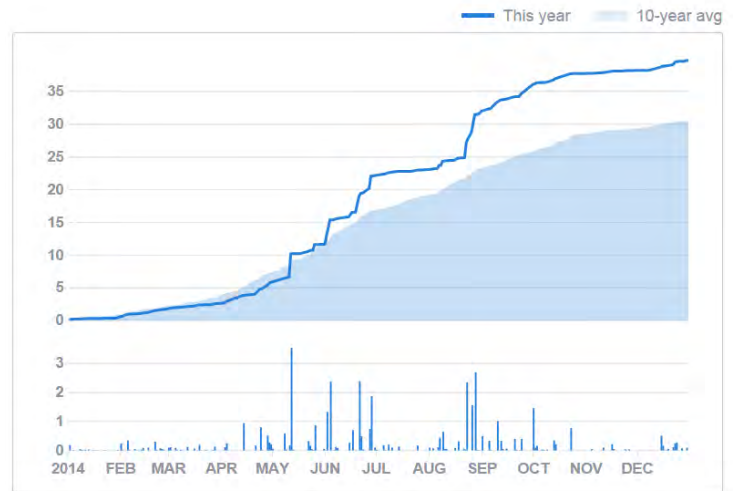
5/6/14 **Post:** 24 oz/ac Glyphosate

Insecticides/Fungicides: Poncho/VOTIVO seed treatment

Fertilizer: 145 lbs actual N/acre as Anhydrous ammonia, fall 2013

Irrigation: Not Irrigated

Rainfall:



Introduction: As a by-product of certain ethanol production facilities, growers may have access to calcium sulfate which is sold as a soil amendment. The purpose of this study was to determine if the application of calcium sulfate improved rainfed corn yields. The product Pro-Cal 40 was applied at a rate of 1 ton/ac on 12/15/13.

Results:

	Yield [†] (bu/acre)	Moisture (%)	Net Return [‡]
Check	182*	15.2	\$637.00
Calcium Sulfate	182	15.3	\$607.00
<i>P-Value</i>	0.9684	0.1723	--

[†]Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

[‡]Net return based on \$3.50/bu corn and \$30/ton Pro-Cal 40.

Soil samples were taken from each area after the study was harvested. Only one rep was soil sampled.

	pH	Buffer pH	OM	Nitrate- N	Mehlich- P-III	K	S	Zn	Fe	Mn	Cu	Ca	Mg	Na
			-%-	-----ppm-----										
Check	5.8	6.6	3.4	11	36	256	11	1.76	53.3	15.1	1.14	2761	589	15
Calcium Sulfate	6.2	6.8	3.4	5.8	21	262	16	1.42	46.7	12.9	1.09	2756	574	13

Summary: The addition of calcium sulfate did not have any impact on corn yields. Net returns were lower for the calcium sulfate treatment due to the additional cost of calcium sulfate and no increase in yield.

Fall Applied NH3 Fertilizer Rates on Corn

Study ID: 039155201408

County: Saunders

Soil Type: Yutan silty clay loam, Tomek silt loam, Filbert silt loam

Planting Date: 4/25/2014

Harvest Date: 10/31/2014

Population: 31,000 seeds/acre

Row Spacing: 30"

Hybrid: GH 12H71

Reps: 18

Soil Test Values: not available

Previous Crop: Soybeans

Tillage: No-Till

Herbicides:

Pre: 2 qt/ac Lexar on 5/3/14

22 oz/ac Roundup ProMax on 5/3/14

Post: 0.6 oz/ac Armezon on 6/6/14

Touchdown Total on 6/6/14

Insecticides/Fungicides: Avicta Complete Corn Seed Treatment

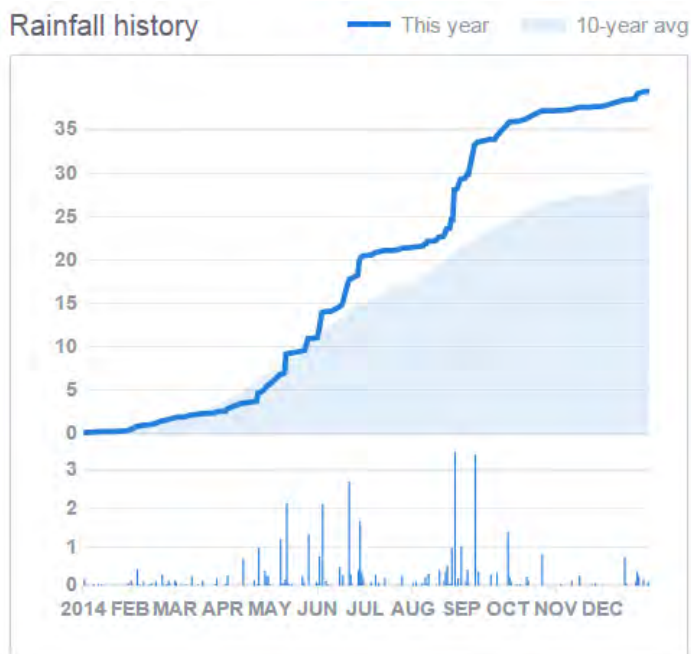
Baythroid XL on 6/26/14

4 oz/ac Priaxor on 6/26/14

10 oz/ac Headline AMP on 8/19/14

Irrigation: Not Irrigated

Rainfall history



Introduction: The purpose of this study was to determine the most profitable nitrogen rate in the production of rainfed corn. This study is a continuation of a similar study, however in 2013 the rates were slightly different. 160# N/acre and 190# N/acre were applied as anhydrous ammonia in fall 2013.

Results:

	Yield [†] (bu/acre)	Moisture (%)	Net Return [‡]
160#/acre	231 A*	17.4 A	\$747.70
190#/acre	226 B	17.3 A	\$718.80
P-Value	0.0004	0.2688	--

[†]Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

[‡]Net return based on \$3.50/bu corn, \$60.80/acre for 160 lb N/ac, and \$72.20/acre for 190 lb N/ac.

Summary: The 160# N/acre treatment was significantly higher yielding than the 190# N/acre treatment.

In-Season Additional N on Deficient Corn – Small Plot

Study ID: 022127201401

County: Nemaha

Soil Type: Nodaway silt loam

Planting Date: 5/7/2014

Harvest Date: 10/6/2014 hand harvested, shelled and weighed

Population: 26,000 seeds/acre

Row Spacing: 30"

Hybrid: unknown

Reps: 4 – small plot

Previous Crop: Soybeans

Tillage: No-till

Soil Test Values: Not available

Herbicides:

Pre: 32 oz/acre Glyphosate + in April
16 oz/acre 2,4 -D in April

Post: 48 oz/acre Glyphosate in June

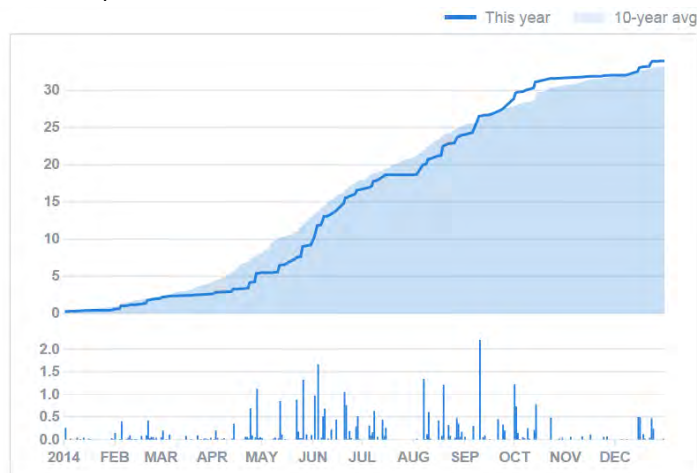
Insecticides/Fungicides: none

Fertilizer: 100 lb/acre Urea 46-0-0 in spring, pre-plant

50 lb/acre Urea 46-0-0 sidedress June

Irrigation: Not irrigated.

Rainfall: Apr: 3.04" May: 2.66" June: 8.43" July: 1.4" Aug: 2.85" Sept: 3.55" Oct: 3.86" Total: 25.79"



Introduction: This study is evaluating mid-season nitrogen application to nitrogen deficient corn. This past spring with some heavy rains, corn showed significant nitrogen deficiencies in the growing season during a critical period of development (R1-R6). This was due to saturated soils which lead to denitrification. Previous on-farm research conducted in Nebraska in 2013 and in Missouri in previous years indicated mid-season nitrogen application may be economically feasible. In Northwest Missouri in 2013, local ag suppliers were flying on urea to nitrogen deficient corn fields. This experiment was conducted to test the feasibility of this management practice. In early July, the nitrogen deficient corn field was identified. On July 15th, nitrogen was applied at the rates of 0, 50, 75 and 100 lbs. N/ac. Nitrogen was applied in a dry form as urea (46-0-0). This method simulated nitrogen being top-dressed with a high clearance ground applicator or through aerial application. The experiment was designed as a complete randomized block design with 4 replications. Each plot was 20' x 10' (4-30" rows). At harvest time, 10' of the 2 middle rows were hand-harvested. Corn was shelled, tested for moisture and yields were calculated on a 15.5% moisture basis.

Results:

	Yield [†] (bu/acre)	Net Return [‡]
0 lb N/acre	72 A*	\$252.00
50 lb N/acre	72 A	\$216.96
75 lb N/acre	83 A	\$241.05
100 lb N/acre	97 A	\$275.65
P-Value	0.2981	--

[†]Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

[‡]Net return based on \$3.50/bu corn, \$530/ton Urea 46-0-0 in July 2014, and \$6.24 custom dry fertilizer application.

Summary: With variable yield results between replications, there were no significant differences between treatments, however there is a trend of increasing yield as N rate increases. Lack of response at the 50 lbs. N/ac may be due to lack of significant rainfall after surface application of urea resulting in nitrogen volatilization and loss to the atmosphere.

Note: In this analysis, N rate is treated as qualitative data; a quantitative data analysis may result in statistically significant yield response.

In-Season Additional N on Deficient Corn – Small Plot

Study ID: 014127201401

County: Nemaha

Soil Type: Nodaway silt loam

Planting Date: 4/28/2014

Harvest Date: 10/20/2014 hand harvested, shelled, and weighed

Population: 22,500

Row Spacing: 30"

Hybrid: Syngenta G14R38

Reps: 4 – small plot

Soil Test Values: Not available

Previous Crop: Corn

Tillage: No-till

Herbicides: Pre: None

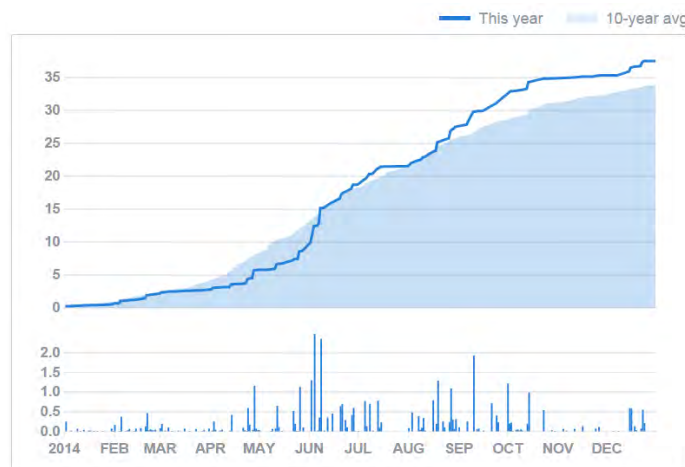
Post: 48 oz/acre Glyphosate in June

Insecticides/Fungicides: None

Fertilizer: 160 lbs/ac anhydrous ammonia in April, pre-plant 6 gal/ac Poly Phos, K, Zn, S as starter at planting.

Irrigation: not irrigated

Rainfall: Apr: 1.25" May: 3" June: 7.2" July: 4.72" Aug: 5.31" Sept: 3.73" Oct: 3.28" Total: 28.49"



Introduction: This study is evaluating mid-season nitrogen application to nitrogen deficient corn. This past spring with some heavy rains, corn showed significant nitrogen deficiencies in the growing season during a critical period of development (R1-R6). This was due to saturated soils which lead to denitrification. Previous on-farm research conducted in Nebraska in 2013 and in Missouri in previous years indicated mid-season nitrogen application may be economically feasible. In Northwest Missouri in 2013, local ag suppliers were flying on urea to nitrogen deficient corn fields. This experiment was conducted to test the feasibility of this management practice. In early July, the nitrogen deficient corn field was identified. On July 28th, nitrogen was applied at the rates of 0, 50, 75 and 100 lbs. N/ac. Nitrogen was applied in a dry form as urea (46-0-0). This method simulated nitrogen being top-dressed with a high clearance ground applicator or through aerial application. The experiment was designed as a complete randomized block design with 4 replications. Each plot was 20' x 10' (4-30" rows). At harvest time, 10' of the 2 middle rows were hand-harvested. Corn was shelled, tested for moisture and yields were calculated on a 15.5% moisture basis.

Results:

	Yield† (bu/acre)	Net Return ‡
0 lb N/acre	103 A*	\$360.50
50 lb N/acre	126 A	\$405.96
75 lb N/acre	126 A	\$391.55
100 lb N/acre	133 A	\$401.65
P-Value	0.2822	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn, \$530/ton Urea 46-0-0 in July 2014, and \$6.24 custom dry fertilizer application.

Summary: With variable yield results between replications, there were no significant differences between treatments. There was a trend toward higher yields with the supplemental nitrogen application.

Note: In this analysis, N rate is treated as qualitative data; a quantitative data analysis may result in statistically significant yield response.

Combined Analysis of Small Plot In-Season Additional N to Deficient Corn

Two rainfed sites in Nemaha County had corn which showed visual signs of being deficient in nitrogen in mid-June. Four rates of rescue nitrogen applications were made on these sites to determine the effect of the additional nitrogen on yield.

Results:

A total of 8 replications were used in this combined analysis. There was no site by treatment interaction and no treatment effect on yield, however there was a significant site effect and a significant N rate effect (Table 1). Therefore means for yield for the site main effect are shown in Table 2 and yield for the N rate effect are shown in Table 3.

Table 1. P-values for site and treatment main effects and site by treatment interaction on yield.

Effect	Pr>F
Site	0.0061
Treatment	0.0953
Site*Treatment	0.7159

Table 2. Means for yield are shown for site (across treatments).

Site number (corresponds to study number)	Yield [†] (bu/acre)
Site 1: 022127201401	81 B
Site 2: 014127201401	122 A

[†]Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

Table 3. Means for yield are shown for the four nitrogen rates tested.

	Yield [†] (bu/acre)	Net Return [‡]
0 lb N/acre	88 B	\$308.00
50 lb N/acre	99 AB	\$311.46
75 lb N/acre	104 AB	\$314.55
100 lb N/acre	115 A	\$338.65

[†]Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

[‡]Net return based on \$3.50/bu corn, \$530/ton Urea 46-0-0 in July 2014, and \$6.24 custom dry fertilizer application.

Summary: The two sites had different yields. Across the two sites, there was an increase in yield as N rate increased. An increase of 27 bu/acre was seen for increasing additional N application from 0 to 100 lb N/acre.

Starter Fertilizer on Rainfed Corn

Study ID: 001155201401

County: Saunders

Soil Type: Aksarben silty clay loam, Yutan silty clay loam

Planting Date: 5/4/2014

Harvest Date: 11/5/2014

Population: 30,500

Row Spacing: 30"

Hybrid: LG2641 VT2 RIB

Reps: 7

Soil Test Values: Not available

Previous Crop: Soybean

Tillage: No-Till

Herbicides: 3 oz/acre Corvus, 1.25 qt/ac Atrazine, 1 qt/ac Roundup PowerMAX

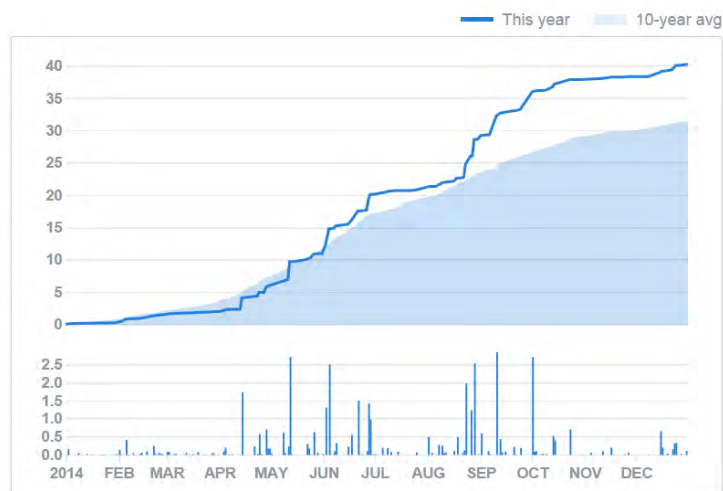
Insecticides/Fungicides: none

Fertilizer: 150# 11-52-0, fall 2013, 130# N/acre of Anhydrous ammonia, fall 2013, 12 gal UAN 32%

Irrigation: Minimum irrigation. Watered twice with pivot.

Note: Hailed on 5/11/14, lost 7%

Rainfall:



Introduction: This study is a continuation of a similar effort conducted during the 2013 growing season. The purpose of this study was to try to answer the question, “Does applying starter fertilizer at planting impact rainfed corn yields”? At planting 5 gal/acre of 10-32-0 plus 1 qt/acre of Zinc were applied as starter in furrow. No soil test results are available for this field.

Results:

	Yield [†] (bu/acre)	Moisture (%)	Harvest Pop	Net Return [‡]
Check	216 A*	14.8 A	26,846 A	\$756.00
Starter	215 A	14.5 B	27,591 A	\$736.20
P-Value	0.8755	<0.0001	0.5729	--

[†]Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

[‡]Net return based on \$3.50/bu and \$16.30/acre starter fertilizer.

Summary: The producer noted a visual difference between the check and starter treated corn early in the growing season with the starter treated corn appearing darker green. The starter fertilizer application did not result in an increase in yield. The check had a higher grain moisture at harvest. There was no difference in stand counts at harvest. Due to the increased cost of application and no increase in yield, the starter fertilizer treatment had lower net returns than the check.

Prolock® on Corn

Study ID: 032035201401

County: Clay

Soil Type: Hastings silt loam

Planting Date: 5/1/2014

Harvest Date: 11/7/2014

Population: 33,000

Row Spacing: 30"

Hybrid: Pioneer 32B16

Reps: 6

Previous Crop: Soybeans

Tillage: No-till

Herbicides: Pre: None

Post: 1.5 qt/ac Lexar on 5/6/2014, 32 oz/ac

Touchdown Total on 6/11/2014

Fertilizers: Fall application of 167 lb actual N/ac

Anhydrous ammonia with a variable rate

application of 11-52-0. 1 gal/ac 28-0-0 on

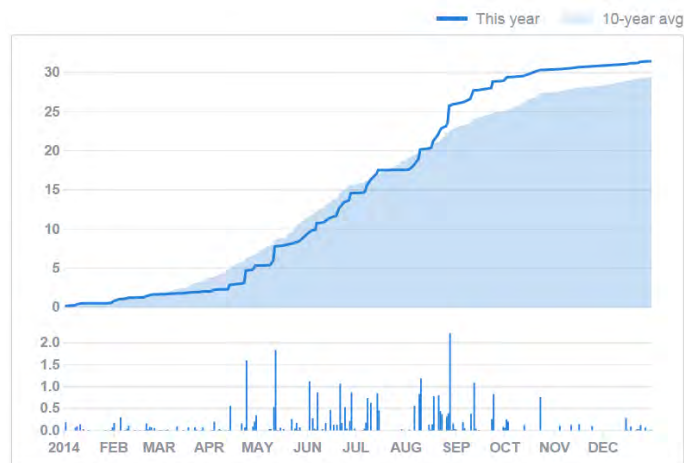
6/11/2014 and 1 gal/ac 10-0-10 on 7/19/2014.

Insecticides/Fungicides: 1.2 oz/ac Baythoid XL on 5/6/2014, 2 oz/ac Priaxor on 6/11/2014, 10.5 oz/ac Quilt Xcel on 7/19/2014

Additional applications: 1 qt/ac Plen-T-Sweet on 6/11/2014 and 1 qt/ac Sweet'n Eazy on 7/19/2014

Irrigation: Pivot – 6"

Rainfall:



Soil Test: (Average for field)

	pH	BpH	OM ---%---	Nitrate -----	P	K	Ca -----ppm-----	Mg	Na	Ca	Zn
Average	6	7	3	8	25	366	2001	273	37	10	1

Introduction: In this study, the producers were looking at the effects of Prolock® on corn yield and economics. The check treatment was the producer's standard starter practice of 3 gal 10-34-0 + 1 qt/acre Micromax (2% Magnesium, 0.25% B, 2% Zn, 1.6% Fe, 0.5%Cu) starter fertilizer. The Prolock® treatment added 1.4 qt/ac Prolock® to the check starter fertilizer treatment. Prolock® is a product sold by Aurora coop and used as an addition to starter fertilizer. Soil test Phosphorus levels ranged from 6-66 ppm in the field where this study occurred with an average P level of 25 ppm which is considered adequate according to UNL research.



Results:

	Yield† (bu/acre)	Moisture (%)	Stalk Rot (%)	Harvest Pop	Net Return ‡
Check (producer's standard starter practice of 3 gal 10-34-0 plus 1 qt/acre Micromax)	276 A*	17.0 A	3.3 A	30,083 A	\$966.00
Check products plus Prolock®	279 A	16.8 A	4.2 A	28,500 A	\$966.50
P-Value	0.3747	0.1201	0.7412	0.3774	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn price and \$10/ac Prolock® cost.

Summary: Results showed no statistical yield difference between the Check and Prolock® for yield, moisture, percent stalk rot, and harvest stand counts.

Helena Nucleus® O-Phos Nutrient Starter Application on Corn

Study ID: 032035201403

County: Clay

Soil Type: Hastings silt loam

Planting Date: 4/21/2014

Harvest Date: 10/27/2014

Population: 33,000 seeds/acre

Row Spacing: 30"

Hybrid: DKC 62-97

Reps: 6

Soil Test Values: not available

Previous Crop: Corn

Tillage: Conventional Till

Herbicides: 13 oz/ac Verdict on 5/7/14

3.6 pt/ac Halex GT on 6/11/14

1 pt/ac Atrazine 4L on 6/11/14

Insecticides/Fungicides: 1.2 oz/ac Baythroid XL on 5/7/14

10.5 oz/ac Quilt Xcel on 7/28/14

Other Applications: 1 qt/ac Plen-T Sweet

Fertilizer: 200 lb actual N/acre as Anhydrous ammonia in fall

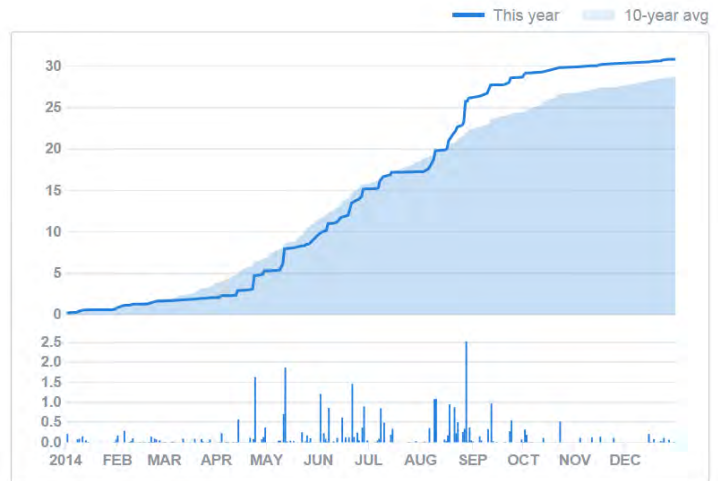
2013, 11-52-0 variable rate application in fall 2013, 109 #

actual N/acre as UAN 32% on 5/7/14, 1 gal/acre of XRN (28-0-0)

on 6/11/14, 1 gal/acre Coron (10-0-10) on 7/28/14

Irrigation: Pivot irrigated, Total: 6"

Rainfall:



Introduction: In this study the grower wished to test the effects of Nucleus® O-Phos starter on corn yield and economics. The check treatment was 3 gallons 10-34-0 + 1 qt/acre Micromax (2% Magnesium, 0.25% B, 2% Zn, 1.6% Fe, 0.5%Cu). The Helena Nucleus® O-Phos product was applied at 1 gal/ac in addition to the check treatment. Both the check and Nucleus® O-Phos treatments were applied at planting. The guaranteed analysis for the product tested is shown at right.



GUARANTEED ANALYSIS:
 Total Nitrogen (N)..... 7.00%
 7.00% Ammoniacal Nitrogen
 Available Phosphate (P₂O₅)..... 21.00%
 Soluble Potash (K₂O)..... 2.00%
 Zinc (Zn)..... 0.10%
 0.10% Chelated Zinc (Zn)
 Derived from: Ammonium phosphate, potassium hydroxide and Zinc EDTA

Results:

	Yield† (bu/acre)	Moisture (%)	Harvest Pop (plants/ac)	Stalk Rot (%)	Net Return ‡
Check (producer's standard starter practice of 3 gal 10-34-0 plus 1 qt/acre Micromax)	266 A*	16.2% A	29,300 B	3.3% B	\$931.00
Check products plus Helena Nucleus® O-Phos	265 A	16.2% A	31,600 A	5.8% A	\$920.25
P-Value	0.2490	0.4838	0.0687	0.0756	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn, \$7.25/gal Nucleus® O-Phos.

Summary: Results showed no statistical yield differences on moisture or yield between the check and Nucleus® O-Phos. There was a statistical difference in stalk rot (less stalk rot in check treatment) and also in stand count (higher stand count in the Nucleus® O-Phos treatment).

TeraOne HYC Application on Soybeans

Study ID: 032035201404

County: Clay

Soil Type: Hastings silt loam

Planting Date: 5/2/2014

Harvest Date: 9/29/2014

Population: 150,000

Row Spacing: 30"

Hybrid: Mycogen 5N255R

Reps: 6

Soil Test Values: not available

Previous Crop: Corn

Tillage: Conventional Till

Herbicides:

Pre: Op Till PRO and 0.75 pt/ac Salvan on 4/10/14

Post: 32 oz/ac Roundup PowerMAX and 6 oz/ac Volunteer on 6/25/14

Insecticides/Fungicides: 1.6 oz/acre Mustang Maxx on 6/25/14

4 oz/ac Priaxor on 7/29/14

Other Applications: 1 qt/ac Sweet'n Eezy on 6/25/14

Introduction: In this study, the producers were looking at the effect of TerraOne HYC applied at planting to soybeans on yield and economics. The product is a combination of mycorrhizal fungi and microbes claimed to help make soil nutrients more available and aid in water and nutrient absorption. TeraOne HYC was applied at planting at 0.125 gal/ac. The TeraOne HYC treatment was compared to no starter fertilizer. Dectes (soybean) stem borer was observed before harvest (Figure 1 and 2) therefore stem borer counts were also taken.

Fertilizer: 11-52-0 as variable rate in fall 2013, 6.29 lbs/ac UAN 32% on 4/10/14, 1 gal/ac XRN 28% (28-0-0) on 6/25/14, 1 qt/acre Brant Smart Trio (4-0-0, 3% S, 0.25% B, 3% Mn, 3% Zn) on 6/25/14, 1 qt/ac Manni-Plex foliar micronutrient on 7/29/14.

Irrigation: Pivot – amount unknown

Rainfall:

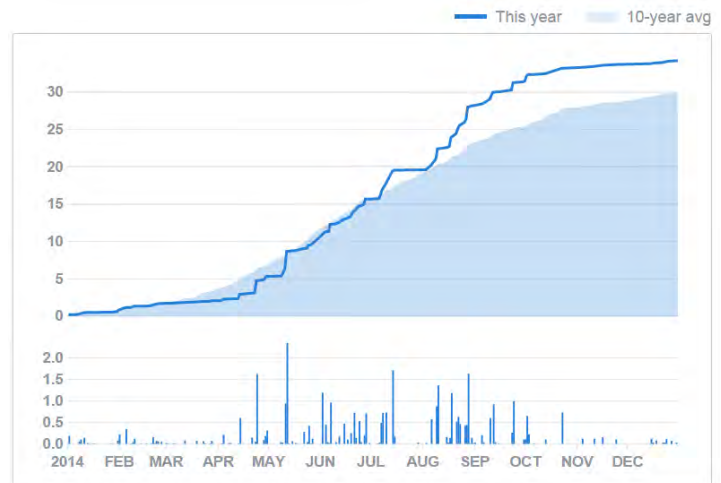


Figure 1: Hole from Dectes (soybean) stem borer observed before harvest where petiole



Figure 2: Slitting open the stem reveals the Dectes stem borer creating it's winter home at the base of the plant.

Results:

	Yield† (bu/acre)	Moisture (%)	Stem Borer (%)	Harvest Pop (plants/acre)	Net Return ‡
Check	80 A*	11.2% A	11.7% A	120,000 A	
TeraOne HYC	81 A	11.1% A	10.8% A	119,500 A	
P-Value	0.5936	0.1747	0.6109	0.5177	

†Bushels per acre corrected to 13% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$10/bu soybeans, and \$14.50/ac for TeraOne HYC

Summary: Results showed no statistical difference between the untreated check and TeraOne HYC on yield, moisture, stand count, or amount of Dectes stem borer present in the field at harvest.

Nachurs® Starter Nutrient Application on Soybeans

Study ID: 032035201405

County: Clay

Soil Type: Hastings silt loam

Planting Date: 5/2/2014

Harvest Date: 9/29/2014

Population: 150,000 seeds/acre

Row Spacing: 30"

Hybrid: Mycogen 5N255R

Reps: 6

Soil Test Values:

Previous Crop: Corn

Tillage: Conventional Till

Herbicides:

Pre: Op Till PRO on 4/10/14

Post: 30 oz/acre Roundup PowerMAX on 6/19/14

8 oz/ac Select Max on 6/19/14

0.5 oz/ac Cadet on 7/3/14

2 oz/ac Sharpen on 9/19/14

Insecticides/Fungicides: 5.2 oz/ac Hero on 7/25/14, 4 oz/ac Priaxor on 7/25/14

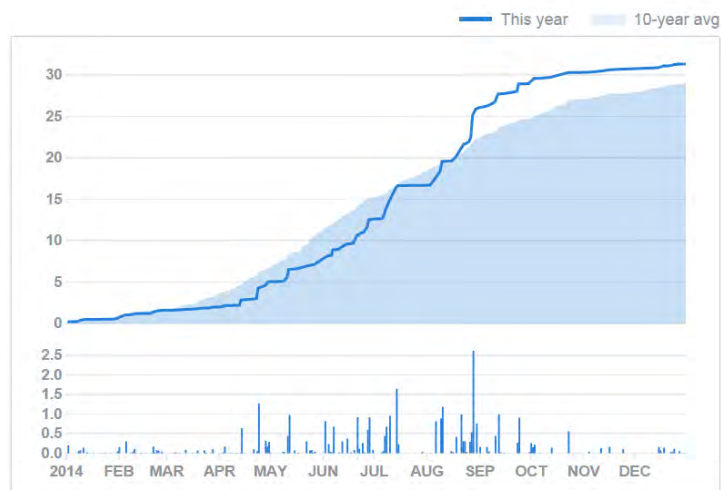
Other Applications: 1 qt/ac Sweet'n Eezy on 7/3/14

Fertilizer: 11-52-0 variable rate in fall 2013, 1 qt/ac

Manni-Plex Foliar Micronutrients on 7/29/14, 1 gal/ac KB fertilizer on 7/2/14

Irrigation: Pivot irrigated, Total: 5"

Rainfall:



Introduction: In this study, the grower looked at the effect of a Nachurs® HKW6 starter product on soybean yield and economics compared to an untreated check. Nachurs® HKW6 was applied at planting at a rate of 2 gal/acre. Guaranteed analysis for the product is shown at right.

Results:

	Yield† (bu/acre)	Moisture (%)	Harvest Pop (plants/ac)	Net Return ‡
Check	91 A*	11.2% A	114,000 A	\$910.00
Nachurs®	91 A	11.2% A	112,333 A	\$901.10
P-Value	0.2040	0.6109	0.5611	--

†Bushels per acre corrected to 13% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$10.00/bu soybean price, 4.45/gal (\$8.90/ac) Nachurs® HKW6

NACHURS HKW6

NUTRIENTS SUPPLIED (pounds per gallon):

Total Nitrogen (N).....	0.21
Available Phosphate (P ₂ O ₅).....	0.62
Soluble Potash (K ₂ O).....	1.66

Derived from: urea, ammonia, phosphoric acid, potassium acetate, and potassium hydroxide.

Summary: Results showed no statistical difference in soybean yield, moisture, or stand count for Nachurs® HKW6 compared to the untreated check.

Comparing Two Starter Fertilizers on Soybeans

Study ID: 019121201401

County: Merrick

Soil Type: Novina sandy loam

Planting Date: 5/14/2014

Harvest Date: unknown

Population: 162,000 seeds/ac

Row Spacing: 30"

Hybrid: ND S28-U7

Reps: 4

Previous Crop: Corn

Tillage: Strip till

Herbicides:

Pre: 2.8 oz/ac Enlite, 0.5 oz/ac, and 32 oz/ac Durango on 5/23/14

Post: 32 oz/ac Durango on 7/30/14

48 oz/ac Durango on 6/25/14

0.3 oz/ac FirstRate and 6 oz/ac Targa on 6/23/14

Insecticides/Fungicides: Cruiser Max Advanced and Vibrance Inoculant Optimizer Seed Treatments.

6 oz/ac Capture LFR and 10.5 oz/ac Quilt Xcel on 7/30/14

Fertilizer: 80 lbs/ac 11-52-0, 50 lb/ac Potash, 50 lb/ac K-Mag, and 1 lb/ac Zinc sulfate broadcast on 4/14/14

10 gal 4-10-10 with strip till on 5/2/14

10 gal/ac thio-sulfate 12-0-0-26 side dress on 7/8/14

Irrigation: Pivot-amounts unknown

Note: Hailed June 3, 2014 at V2-V3 growth stage



Soil Test: Average soil test values for this field are shown in the table below.

	pH	BpH	OM	Nitrate	P	K	S	Ca	Mg	Na	Zn	Fe
			-%-	-----ppm-----								
Average	6.76	6.58	1.93	14.53	32.70	268.58	12.30	1724.80	257.78	33.05	2.15	33.67

Introduction: In this study, the grower looked at the effect of two starter products on soybean yield and economics compared to an untreated check. The first starter product was Conklin starter (8-16-11-2) applied at 1 gal/ac. The second starter product was Aurora starter applied at 1 gal/ac (proprietary product containing an ortho based iron – analysis not available). Both were applied at planting.

Results:

	Yield† (bu/acre)	Net Return ‡
Check	76 B*	\$760.00
Conklin	77 B	\$763.10
Aurora	78 A	\$768.50
P-Value	0.0117	--

Summary: Results showed no statistical difference in soybean yield between the Conklin starter and the untreated check. The Aurora starter was significantly higher yielding than both the check and Conklin starter.

†Bushels per acre corrected to 13% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$10/bu soybean price, \$6.90/gal Conklin Starter, \$11.50/gal Aurora Starter

Strip-till Fertilizer Placement in Soybeans

Study ID: 024155201401

County: Saunders

Soil Type: Aksarben silty clay loam

Planting Date: 5/6/2014

Harvest Date: 9/29/2014

Population: 140,000

Row Spacing: 30"

Hybrid: NK Brand 28-K1

Reps: 9

Soil Test Values: not available

Previous Crop: Corn

Tillage: Strip-till

Insecticides/Fungicides: CruiserMaxx seed treatment

3.2 oz/ac Indigo on 8/1/14

4 oz/ac Priaxor on 8/1/14

Herbicides:

Pre: 3 oz/ac Valor XLT mid-March

1 pt/ac 2,4-D LV6 mid-March

Post: 22 oz/ac Roudup PowerMAX mid-June

4 oz/ac Section mid-June

Irrigation: Pivot: July: 1.25" Aug: 3.75"



Introduction: Strip tillage is an agronomic practice that prepares the seedbed and offers the opportunity for nutrient placement. This grower typically supplies fertilizer at strip-till in the fall prior to corn production. The purpose of this study was to determine if placement of nutrients with strip-till prior to soybeans would have an impact on soybean yields. The check treatment was strip-tilled and no nutrients were applied. The strip-till plus nutrient treatment supplied 80 lb/ac 11-52-0, 20 lb/ac 0-0-60, and 5 lb/ac elemental sulfur at a depth of 6-8". Strip-till implement shown in Figure 1.



Figure 1: Strip-till implement used for fertilizer application in this study.

Results:

	Yield [†] (bu/acre)	Moisture (%)	Net Return [‡]
Check (Strip-till, no nutrients)	75 B*	12.8 A	\$750.00
Strip-till plus nutrients	79 A	12.8 A	\$763.50
P-Value	<0.0001	0.9146	--

[†]Bushels per acre corrected to 13% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

[‡]Net return based on \$10/bu soybean price and \$26.50/ac fertilizer price.

Summary: The strip-till plus nutrients treatment resulted in significantly higher yields and higher net return than the check (strip-till with no nutrients).

Zinc and Phosphorus Foliar Topdress in Wheat

Study ID: 025155201402

County: Saunders

Soil Type: Tomek, Filber, and Fillmore silt loam

Planting Date: 10/12/2013

Harvest Date: unknown

Population: 2.1 bu/ac (125#/ac)

Row Spacing: Drilled 7.5"

Hybrid: Overland Wheat

Reps: 3

Soil Test Values: not available

Previous Crop: Soybeans

Tillage: No-Till

Herbicides: 0.9 oz/ac Harmony Extra on 4/19/14

6 oz/ac 2,4-D on 4/19/14

Insecticides/Fungicides: Evergol Energy seed treatment

7 oz/ac Prosaro on 6/5/14

Irrigation: not irrigated



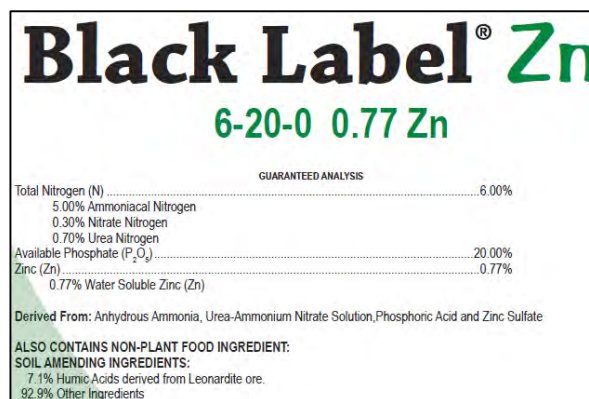
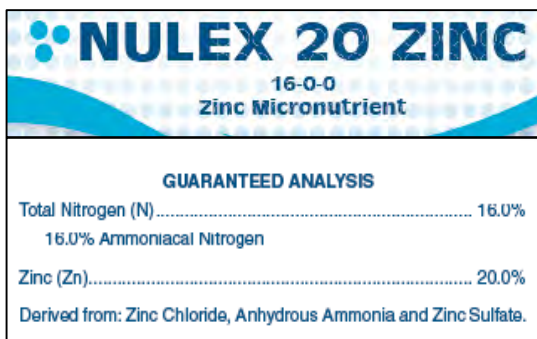
Introduction: The purpose of this study was to determine if foliar applied zinc and phosphorus increased the grain yield of wheat. All treatments were applied on 4/5/14. The treatments are as follows:

Treatment 1: Nitrogen only (23 gal/ac UAN 32%)

Treatment 2: Nitrogen + Nulex 20 Zinc (23 gal/ac UAN 32% + 1 qt/ac Nulex 20 Zinc)

Treatment 3: Nitrogen + Black Label® Zn (23 gal/ac UAN 32% + 1 gal/ac Black Label® Zn)

(Guaranteed analysis for products used are below.)



Results:

	Yield† (bu/acre)	Moisture (%)	Test Weight (lb/bu)	Net Return ‡
Trt 1: N only	78 A*	12.1 A	57.0 B	\$434.88
Trt 2: N + Nulex 20 Zinc	82 A	12.4 A	58.0 AB	\$456.44
Trt 3: N + Black Label® Zn	82 A	12.1 A	58.3 A	\$448.63
P-Value	0.2064	0.5616	0.0772	--

†Bushels per acre not corrected for moisture.

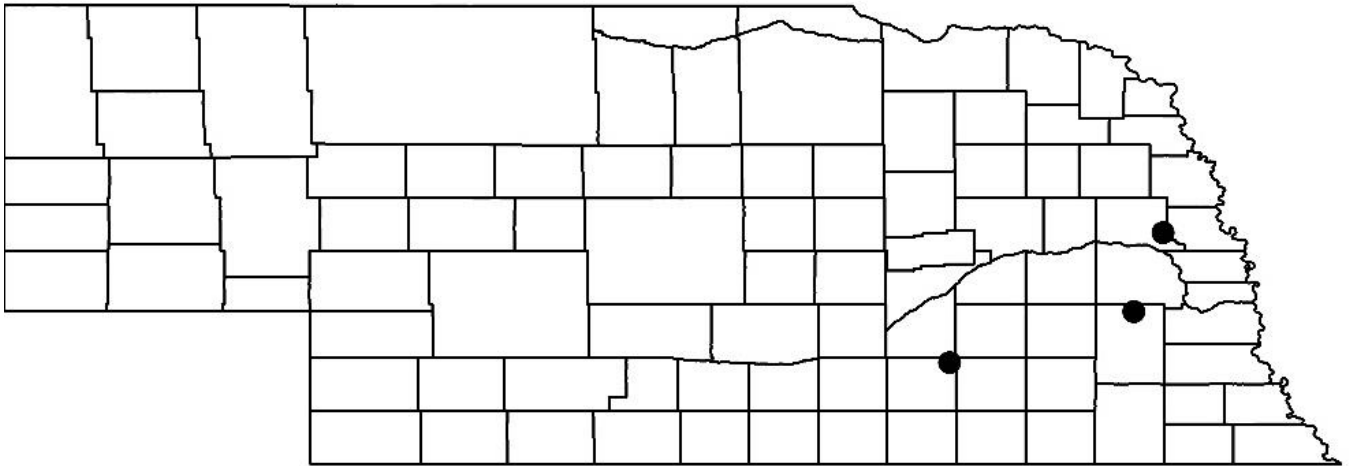
*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$6/bu wheat price, \$33.12/ac for treatment 1 products, and \$35.56 for treatment 2 products, and \$43.37 for treatment 3 products. No application cost is included as all treatments shared this cost.

Summary: There was no significant difference in yield for any of the treatments tested.

Planting Operation Studies

Planting Operation Study Locations:



Row Cleaners in the Production of Rainfed Corn

Study ID: 030109201404

County: Lancaster

Soil Type: Aksarben – Silty Clay Loam

Planting Date: 5/4/2014

Harvest Date: 11/10/14

Population: 30,000

Row Spacing: 30"

Hybrid: DKC 62-97

Reps: 8

Soil Test Values: not available

Previous Crop: Soybeans

Tillage: No-till

Herbicides: Pre: 2.1 qt Trizmet II

Post: 1.87 oz Calisto + 24 oz Roundup

PowerMAX - Early June

Insecticides/Fungicides: Poncho 1250, Accelron

Fertilizer: 160 lbs NH3 - Nov 2013



Introduction: Many corn growers have a significant dollar investment in adding row cleaning devices to their planters. The purpose of this study was to document the yield impact from the use of row cleaners in the production of rainfed corn.

Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Check	206 A*	16.2 A	\$720.27
Residue Remover	204 A	16.2 A	\$712.27
<i>P-Value</i>	0.1207	0.2470	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50 corn, row cleaners \$320/row, 16 row planter, \$5120 over 5 years over all acres, final = \$1/ac

Summary: There was no yield or moisture difference between the check and residue remover treatment. More erosion noted where row cleaners were used.

Planting Depth of Corn

Study ID: 029053201404

County: Dodge

Soil Type: Moody – Silty Clay Loam

Planting Date: 5/6/2014

Harvest Date: 11/8/2014

Population: 28,000

Row Spacing: 36"

Hybrid: P1023

Reps: 8

Soil Test Values: not available

Previous Crop: Soybeans

Tillage: No-Till

Herbicides: Pre: 4 oz Balance Flexx + Atrazine 4 L + 1 pt Parallel Plus – 4/15/2014

Post: 3 oz Laudis + 1 qt Cornerstone Plus + ½ pt Atrazine 4 L – 6/11/2014

Insecticides/Fungicides: Crusier 250 seed treatment

Fertilizer: 30 gal UAN 32% – Mid April, 6 gal MAP + 7 lb Zinc sulfate in furrow – 5/6/2014

Notes: Hailed at V5 (6/4/14)

Irrigation: Not irrigated.

Rainfall:



Introduction: The purpose of this study was to determine if the planting depth of corn influenced final harvest populations, yield, and net return.

Results:

	Yield† (bu/acre)	Moisture (%)	Harvest Pop	Net Return ‡
1.75"	164 B*	16.2 B	22,213 A	\$574.49
2.25"	170 A	16.3 A	22,746 A	\$594.69
P-Value	<i>0.0148</i>	<i>0.0956</i>	<i>0.8042</i>	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50 corn.

Summary: The 2.25" planting depth had significantly higher yields (6 bu/ac increase) and had higher moisture. Stand counts for both planting depths were not significantly different. The producer believes that following the hail event at V5 the deeper planted seeds had less soft seedling rot and therefore had healthier plants. The deeper seeding was slower to come up than the shallower seeding, but the stand was more uniform.

Soybean Row Spacing

Study ID: 032035201406

County: Clay

Soil Type: Hastings silt loam

Planting Date: 5/3/2014

Harvest Date: 9/29/2014

Population: 150,000 seeds/ac

Hybrid: Mycogen 5N312R

Reps: 6

Previous Crop: Corn

Tillage: Vertical Tillage

Herbicides:

Pre: Op Till PRO and 0.75 pt/ac Salvan on 4/10/14

Post: 32 oz/ac Roundup PowerMAX and 6 oz/ac Volunteer on 6/25/14

32 oz/ac Roundup PowerMAX and 0.5 oz/ac Cadet on 7/7/14

2 oz/ac Sharpen on 9/20/14

Insecticides/Fungicides: Uprise and Activate seed treatment

1.6 oz/ac Mustang Maxx on 6/25/14

4 oz/ac Priaxor on 7/25/14

5.2 oz/ac Hero on 7/29/14

Fertilizer: 11-52-0 variable rate in fall 2013

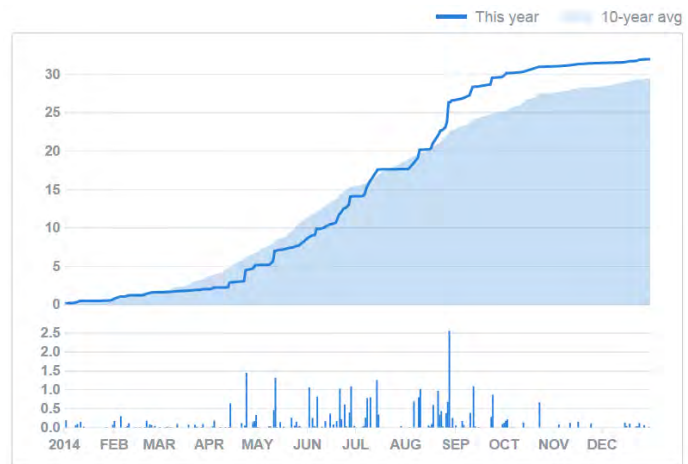
6.29 lbs/ac UAN 32% on 4/10/14

1 gal/ac XRN 28% (29-0-0) on 6/25/14

1 qt/ac Manni-Plex Foliar Micronutrient on 7/29/14

Irrigation: Pivot, Total: 4.5"

Rainfall:



Introduction: Research results from UNL's Soybean Management Field Days showed a yield benefit for 15" row spacing compared to 30" rows. In this study, the grower desired to look at yield effects due to 15" and 30" row spacing in their own soybean field.

Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
15"	84 A*	13.1 A	\$841.10
30"	85 A	13.1 A	\$850.21
P-Value	0.4436	1.0000	--

†Bushels per acre corrected to 13% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$10.00 soybeans.

Summary: Harvest stand counts were around 135,000 plants/acre for both row spacing treatments. There was tremendous lodging throughout the field and 15" row spacing showed greater lodging. Results of this study showed no statistical differences for yield or moisture between 15" and 30" row spacing for soybeans.

Nebraska Extension: Nebraska On-Farm Research Network Corn Planting Population Summary (2010-2013)

Rainfed Studies

Introduction:

Industry has been encouraging growers to increase their corn plant populations. Subsequently, more and more growers are asking the question “what is the most profitable planting rate for corn”? From 2010 to 2013 the Nebraska On-Farm Research Network has conducted 21 corn planting population studies in dryland conditions. The purpose of these studies was to determine which of the planting rates tested was the most profitable. The populations chosen in these studies represent a range often used by many growers in Eastern Nebraska. The county, climatic region, seeding rates studied at each location, and planting and harvesting dates are in shown in Table 1. Figure 1 shows the location of the climatic regions in Nebraska.

Table 1. County location and climatic region for 21 dryland corn population research sites.

Site	Year	County	Climatic region	Seeding Rates (in thousands seeds/acre)	Planting	Harvesting	Hybrid ‡
1	2010	Seward	EC*	18, 22, 26	unknown	unknown	C 211-83S
2	2010	Clay	SE	18.8, 22.775, 26,4	Unknown	unknown	P 35F40
3	2010	Cass†	EC	24, 30	4/6/10	9/15/10	DKC 65-63
4	2011	Saunders	EC	26, 28,30	5/5/11	10/22/11	C 210-57STX
5	2011	Saunders	EC	26, 28, 30	5/5/11	10/22/11	C 212-45STX
6	2011	Cass†	EC	24, 30	5/7/11	10/10/11	DKC 65-63
7	2011	Dodge	EC	24.5, 27	4/28/11	10/14/11	GH 9416
8	2012	Saunders	EC	26, 28, 30	5/11/12	10/8/12	C 212-45STX
9	2012	Saunders	EC	26, 28, 30	5/11/12	10/8/12	C 208-71VT2
10	2012	Saunders	EC	24, 28, 32, 36	4/27/12	9/14/12	H 8691
11	2012	Cass†	EC	24, 28, 32, 36	4/21/12	9/7/12	DKC 67-57
12	2012	Dodge	EC	24.5, 27	4/22/12	9/4/12	DKC 63-83
13	2012	Washington	EC	24, 28, 32, 36	4/25/12	9/11/12	DKC 59-88
14	2012	Platte	EC	25, 29	5/5/12	9/18/12	H 7711
15	2012	Platte	EC	25, 29	5/5/12	9/18/12	H 7876
16	2013	Saunders	EC	26, 28, 30	5/15/13	11/2/13	C 212-86STX
17	2013	Saunders	EC	26, 28, 30	5/15/13	11/2/13	C 213-40VT3
18	2013	Saunders	EC	24, 28, 32	5/16/13	unknown	H 8691
19	2013	Otoe	SE	28, 32, 36, 40	4/6/13	9/23/13	DKC 64-69
20	2013	Dodge	EC	24, 28, 32, 36	4/28/13	unknown	P 1498

*EC = East Central, SE = Southeast

† While not technically irrigated, these sites are located in river-bottom ground with a high water table and may be considered to be naturally sub-irrigated.

‡ Seed abbreviations = DKC = DEKALB®, C = Channel®, P = Pioneer®, H = Hoegemeyer™, GH = Golden Harvest®

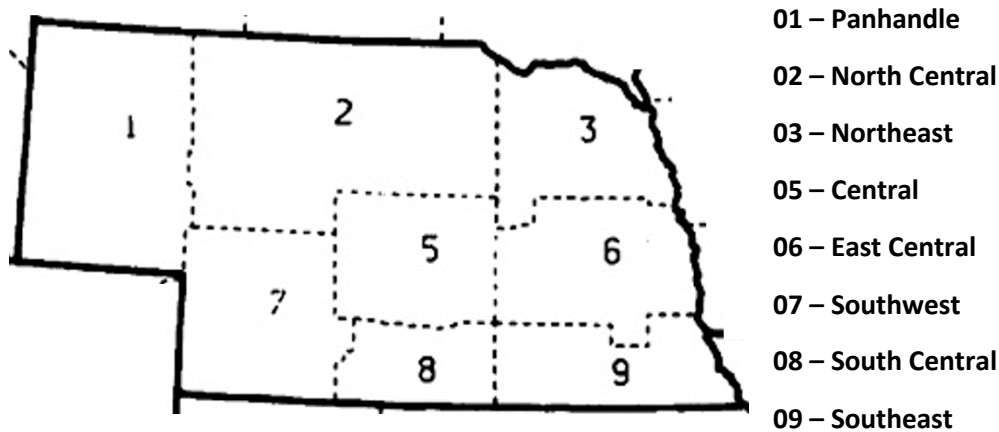


Figure 1. Climatic regions of Nebraska.

Because these are dryland sites, rainfall plays a large role in the final grain yields. To characterize rainfall conditions, the Palmer drought severity index values are reported for climatic regions where field studies were located (Table 2) (National Climatic Data Center, 2014). In 2010 and 2011 both the east central and southeast regions were not drought stressed. The east central region in 2010 was moderately to extremely moist throughout the year. In 2012 and 2013 both regions experienced drought conditions, with the east central region ranging from moderate to extreme drought and the southeast region ranging from moderate to severe drought.

Table 2. Palmer drought severity index for climatic regions with dryland field sites, 2010-2013. Classes: -4.00 and below (extreme drought), -3.00 to -3.99 (severe drought), -2.00 to -2.99 (moderate drought), -1.99 to 1.99 (mid-range), 2.00 to 2.00 (moderately moist), 3.00 to 3.99 (very moist), and 4.0 and above (extremely moist). (National Climatic Data Center, 2014).

Climatic Region	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
2010												
East Central	3.56	3.46	3.33	2.87	2.37	4.11	4.56	4.20	3.99	3.04	2.68	2.10
Southeast	2.28	2.28	2.54	2.32	2.29	2.91	3.05	2.69	2.81	-0.65	-0.30	-0.63
2011												
East Central	2.20	1.82	1.27	1.51	2.43	2.19	2.42	2.87	-0.59	-0.77	-0.96	-0.64
Southeast	-0.40	-0.46	-0.95	0.10	0.56	0.34	0.65	1.36	-0.62	-1.13	0.10	0.55
2012												
East Central	-0.92	-0.33	-1.32	-1.41	-1.55	-2.07	-3.46	-4.17	-4.80	-4.48	-4.70	-4.21
Southeast	0.28	1.01	-0.65	-0.49	-1.40	-1.40	-2.30	-2.77	-3.38	-3.02	-3.43	-3.29
2013												
East Central	-4.27	-4.31	-4.15	0.61	1.73	-0.24	-0.60	-0.91	-1.44	1.21	1.25	-0.28
Southeast	-3.25	-3.28	-3.38	-2.45	-0.90	-1.42	-1.57	-1.69	-1.83	-1.00	-0.84	-1.03

Results: Dryland yields ranged from 53.3 bu/acre to 283.6 bu/acre. At lower yielding sites (yields below 115 bu/acre) increasing plant population resulted in decreased yield. At higher yielding sites (yields above 115 bu/acre) increasing plant population resulted in increased yield. The lower yielding sites all occurred during 2012 and low yields are attributed to drought. Because the low yielding sites and high yielding sites have a different yield response to planting population, low and high yielding sites were analyzed separately. Both the high yielding sites and low yielding sites were fit to a linear relationship (Figure 2). For the high yielding sites,

each additional 1,000 seeds resulted in an increase of 1.6 bu/acre yield. Conversely, for the low yielding drought sites each additional 1,000 seeds planted resulted in a loss of 1.3 bu/acre yield.

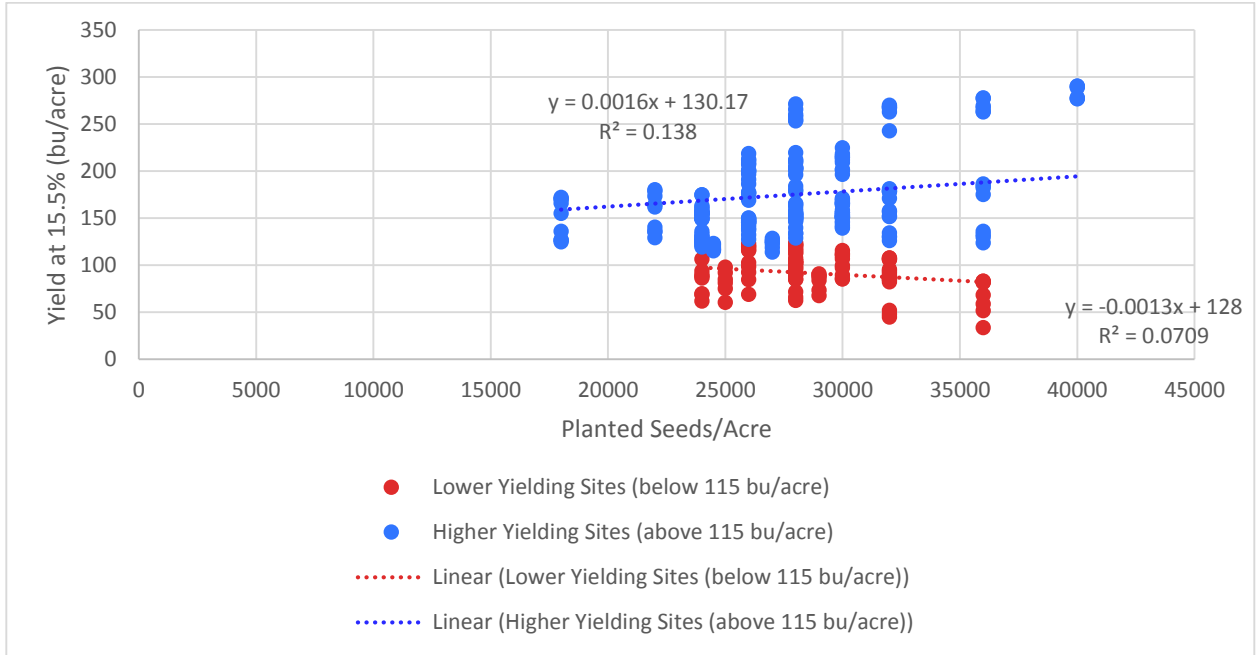
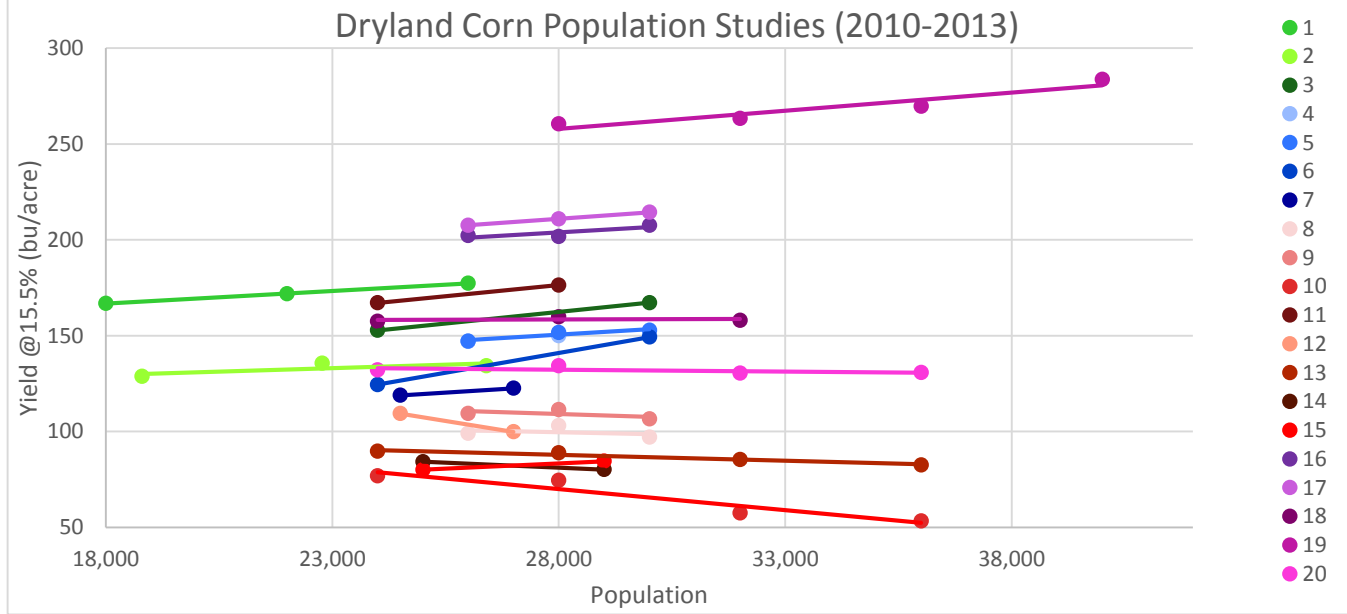


Figure 2. Linear relationships of planting rate and yield at low and high yielding sites. Low yielding sites had a significant negative linear relationship ($p=0.0019$) and high yielding sites had a significant positive linear relationship ($p=0.0001$).

The highest planting rate tested was 40,000 seeds/acre. When rainfall was adequate, increases in yield were seen at this population.

Linear relationships for the individual sites tested are shown in Figure 3.



*Linear relationships between corn yields and planting populations for 20 site years between 2010 and 2013.

Figure 3. Individual linear relationships for each site where planting populations were tested.

Irrigated Studies

From 2010 to 2013, 11 irrigated corn population studies were conducted with Nebraska’s On-Farm Research Network. The purpose of these studies was to determine which of the planting rates tested, was the most profitable. The populations chosen in these studies represent a range often used by many growers in Eastern and Central Nebraska. A summary of these studies follows. Table 1 shows the locations and seeding rates tested for each site. Linear relationships for each site are shown in Figure 1.

Table 1. Location and seeding rates tested for 13 irrigated sites.

Site	Year	County	Seeding Rates (in thousands seeds/acre)	Hybrid ‡
1	2010	Seward	28, 32, 36, 40	C 211-83S
2	2010	Clay	28, 32, 36, 40	unknown
3	2011	Hamilton	28, 32, 36, 40	P 1625
4	2011	Seward	28, 32, 36, 40	C 209-77VT3
5	2012	Dodge	32, 36, 40	P 1625
6	2012	Dodge	32, 36, 40	P 1395AM
7*	2012	Seward	30, 34, 38, 42	BC 15-80
8	2012	Seward	28, 32, 36, 40	C 211-82R
9*	2012	Hamilton	30, 34, 38, 42	P 33D47
10	2012	Hamilton	30, 34, 38, 42	DKC 63-87
11	2013	Dodge	32, 36, 40	C 215-52
12	2013	Dodge	32, 37	H 8066 AMX
13	2013	Dodge	32, 37	H 8345 AM

* These sites had limited irrigation available.

‡ Seed abbreviations = DKC = DEKALB®, C = Channel®, P = Pioneer®, H = Hoegemeyer™, GH = Golden Harvest®, BC = Big Cob Hybrids

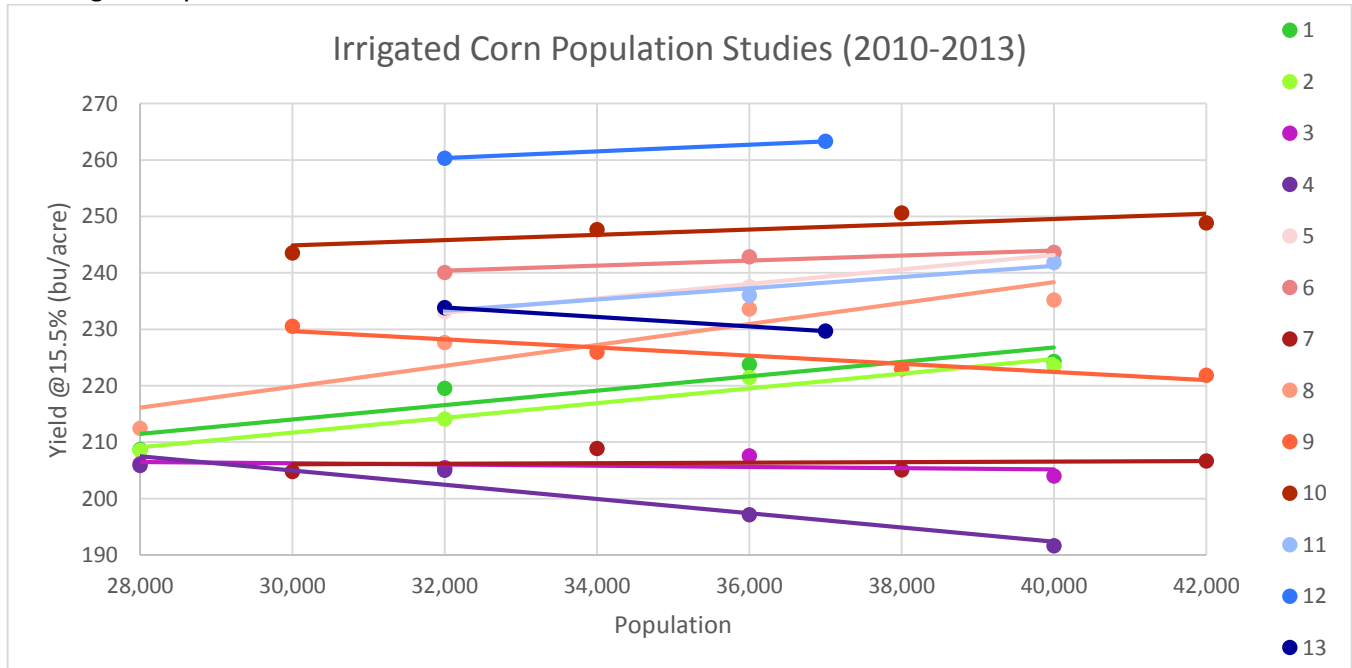


Figure 1. Individual linear relationships between corn yields and planting population for 11 site years between 2010 and 2013.

To make a broad inference across site years, a linear regression was conducted. For the linear regression the two sites with limited irrigation were excluded. The linear effect was statistically significant at an alpha=0.10 level with a p-value of 0.0802. Slope and intercept were treated as random. The result of this analysis is shown in Figure 1. Small but significant increases in yield were seen as population increased. For each additional 1,000 seeds, 0.5 bu of yield is added.

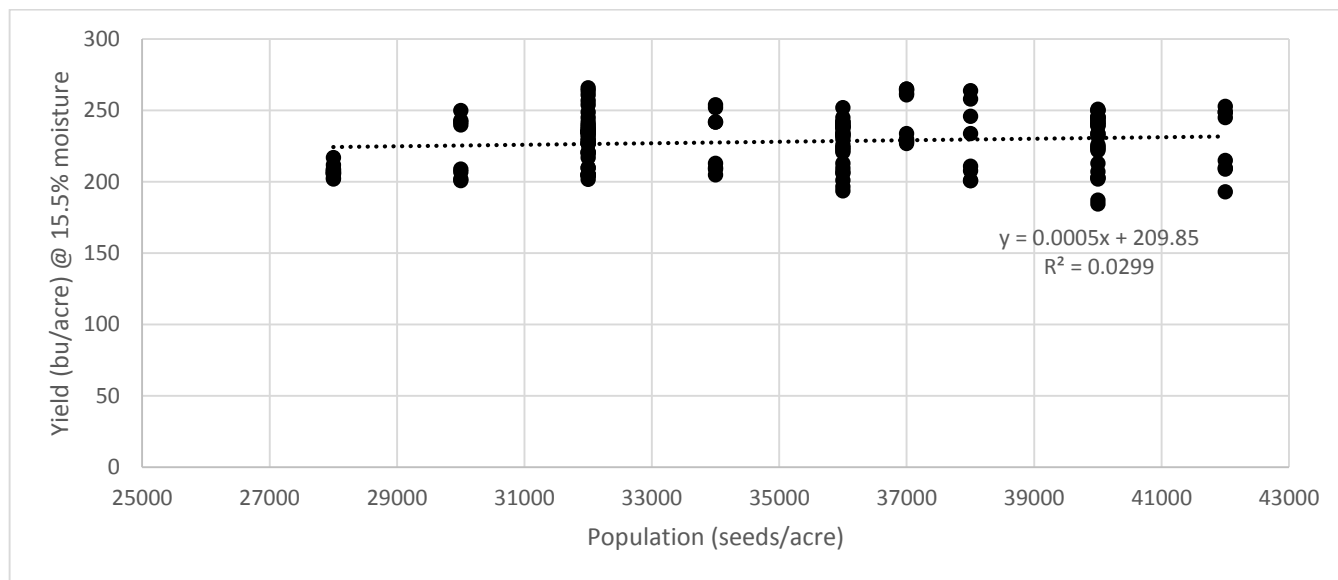
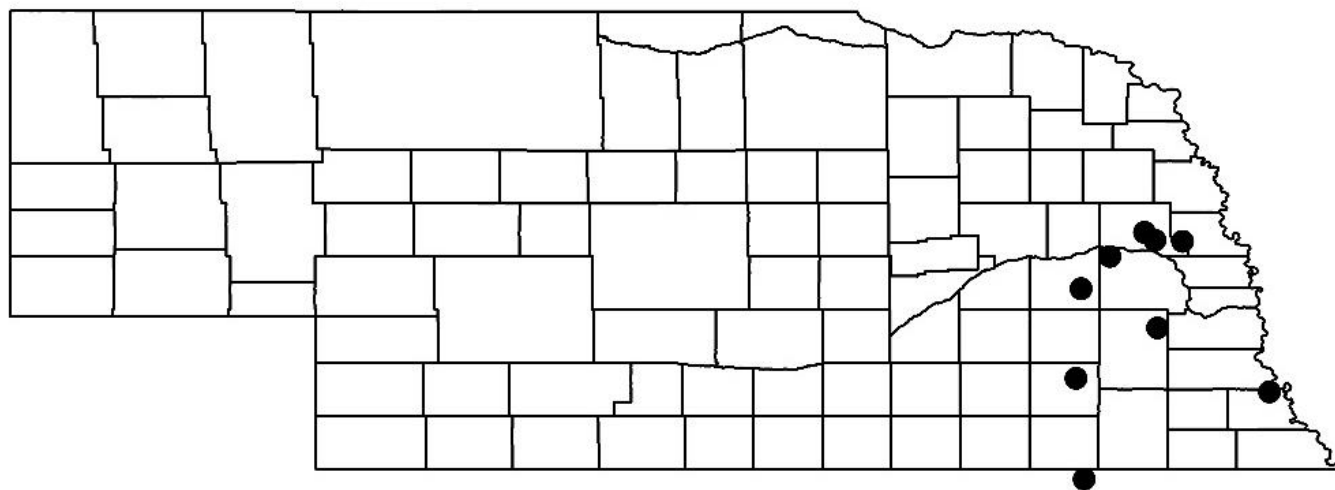


Figure 2. Linear regression of yield and population. For each additional 1,000 seeds planted, an additional 0.5 bu/acre of yield was achieved.

In 2014, 9 studies focused on corn populations. Locations are shown below.

2014 Corn Population Study Locations:



Rainfed Corn Population Study

Study ID: 028109201401

County: Lancaster

Soil Type: Kennebec silt loam, Wabash silty clay

Planting Date: 4/22/2014

Harvest Date: 11/8/2014

Row Spacing: 20"

Hybrid: DKC 64-87 RIB

Reps: 4

Previous Crop: Soybeans

Tillage: No-till

Herbicides: Pre: Corvus, Atrazine 4L, 2,4-D LV6

Post: Laudis and Roundup PowerMAX

Insecticides/Fungicides:

6 oz/ac Capture LFR (4 oz/ac in furrow, 2 oz/ac with pre-emerge herbicide)

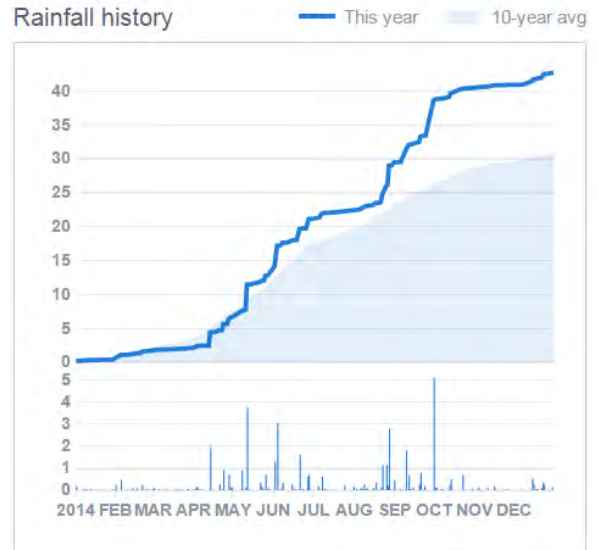
Fertilizer:

175#N/acre as anhydrous ammonia in fall 2013

150# 10-34-0 in winter

5.625 gal/ac 10-34-0 as starter

0.375 gal/ac Zinc chelate (Zn-EDTA) as starter



Introduction: Industry has been encouraging growers to increase their corn plant populations. Subsequently, more and more are growers are asking the question “What is the most profitable planting rate for corn?” The purpose of this study was to determine of the four planting rates selected, which was the most profitable. The populations chosen in this study represent a range often used by many growers in Eastern Nebraska.

Results:

	Yield [†] (bu/acre)	Moisture (%)	Net Return [‡]
28,000 seeds/ac	224 C*	15.2 A	\$692.61
32,000 seeds/ac	234 B	15.0 A	\$714.56
36,000 seeds/ac	244 A	14.9 A	\$736.50
40,000 seeds/ac	245 A	15.0 A	\$726.94
<i>P-Value</i>	<0.0001	0.3717	--

[†]Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

[‡]Net return based on \$3.50/bu corn price and \$261.11/bag of 80,000 seeds.

Summary: The highest yielding populations were 36,000 and 40,000. These populations were statistically higher than planting 28,000 or 32,000 seeds/acre. No increase in yield was seen by increasing seeding rate from 36,000 to 40,000 seed/acre. The greatest net return was for 36,000 seeds/acre.

Rainfed Corn Population Study

Study ID: 018177201401

County: Washington

Soil Type: Moody silty clay loam

Planting Date: 5/5/2014

Harvest Date: 11/3/2014

Row Spacing: 30"

Hybrid: DKC 62-98

Reps: 5

Previous Crop: Soybeans

Tillage: no-till corn into soybeans (till before soybeans)

Herbicides:

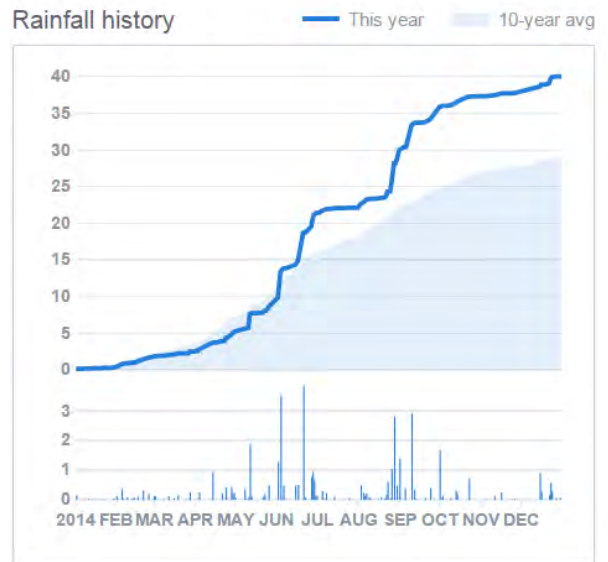
Pre: 4 oz/ac Corvus, 2 pt/ac Atrazine 4L, and 8 oz/ac 2,4-D on 4/18/14

Post: 30 oz/ac Roundup PowerMAX and 1.5 – 2 oz/ac Laudis on 6/20/14

Insecticides/Fungicides: none

Fertilizer: 140# actual N/ac as UAN 32% on 4/18/14

Note: Hail at end of May at V6



Introduction: The purpose of this study was to determine which of the three planting rates selected, were the most profitable. The populations chosen in this study represent a range often used by many growers in Eastern Nebraska to grow rainfed corn.

Results:

	Yield† (bu/acre)	Harvest Pop (plants/acre)	Net Return ‡
26,000 seeds/ac	194 B*	26,468 C	\$574.74
30,000 seeds/ac	200 B	29,866 B	\$579.70
34,000 seeds/ac	208 A	34,034 A	\$591.66
<i>P-Value</i>	0.0071	<0.0001	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn price and \$320.80/bag of 80,000 seeds.

Summary: The highest yielding planting population was 34,000 seeds/acre. This rate was significantly higher yielding than the 30,000 and 26,000 seeds/acre rate. The highest net return came from the 34,000 seeds/acre rate.

Rainfed Corn Population Study

Study ID: 027025201401

County: Cass

Soil Type: Albaton silty clay, Moville & Nodaway silt loam

Planting Date: 4/1/2014

Harvest Date: 10/27/2014

Row Spacing: 30"

Hybrid: DKC 67-57 RIB

Reps: 6

Previous Crop: Soybean

Tillage: No-till

Herbicides:

Pre: 2.5 qt/ac Degree Xtra on 3/15/14

Post: 32 oz/ac Roundup WeatherMAX on 5/25/14

Insecticides/Fungicides:

3.4 oz/ac Capture LFR and 3 oz/ac Headline EC in furrow

12 oz/ac Quilt Xcel on 6/23/14

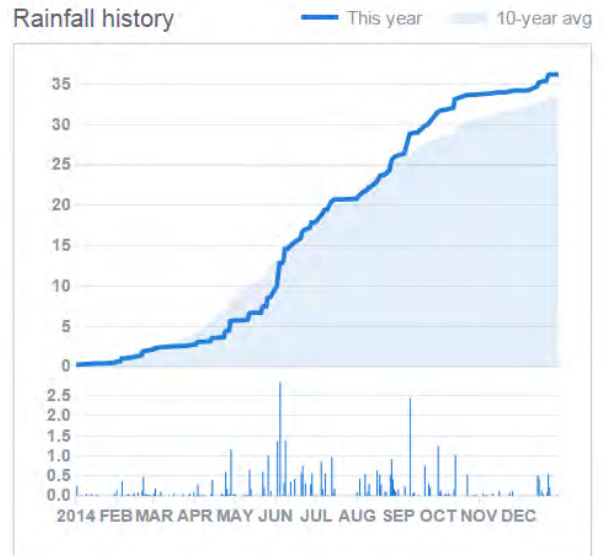
3 oz/ac Headline EC on 8/3/14

Fertilizer:

5 gal/ac Optistart Pro 9-18-6-2S-0.5Zn-Mn with Avail at planting

180# actual N/ac as UAN with herbicide

9.5# actual N/ac and 45# actual P/ac as 11-52-0 plus 15# S/ac and 0.5# Zn/ac



Introduction: This is a continuation study which was started during the 2010 growing season. The purpose of this study was to determine the corn plant population which was the most profitable. The populations chosen to be evaluated this year and in previous years were determined by the grower. The field associated with this study is sub-irrigated.

Results:

	Yield† (bu/acre)	Moisture (%)	Harvest Pop (plants/acre)	Net Return ‡
28,000 seeds/ac	309 B*	14.2 A	27,083 D	\$987.43
32,000 seeds/ac	322 A	14.3 A	30,833 C	\$1019.49
36,000 seeds/ac	321 A	14.3 A	35,000 B	\$1002.55
40,000 seeds/ac	322 A	14.3 A	38,583 A	\$992.61
<i>P-Value</i>	<i>0.0078</i>	<i>0.1542</i>	<i><0.0001</i>	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn price and \$268.78/bag of 80,000 seeds.

Summary: Yield was significantly increased by increasing the seeding rate from 28,000 to 32,000 seeds/ac. No yield increase was seen for increasing plant populations above 32,000 seed/ac. The seeding rate with the highest net return was 32,000 seeds/ac.

Rainfed Corn Population Study: Seed Rate by Hybrid

Study ID: 007155201401

County: Saunders

Soil Type: Yutan Silty Clay Loam

Planting Date: 5/4/2014

Harvest Date: 11/8/2014

Row Spacing: 15"

Reps: 5

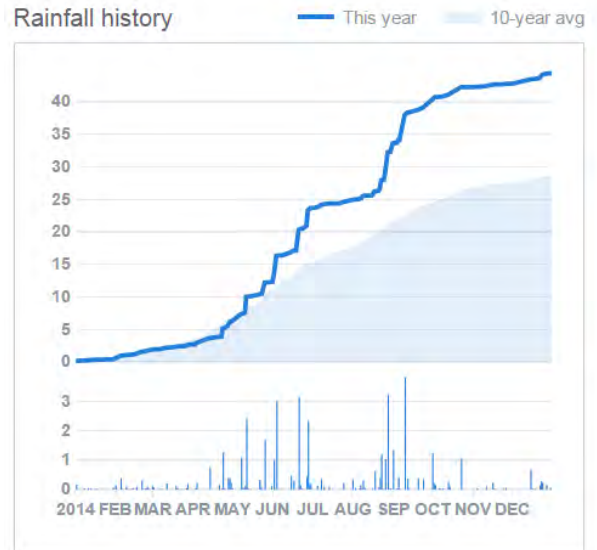
Previous Crop: Soybeans

Tillage: No-till

Herbicides: Pre: 4.5 oz/ac Corvus and 1 lb/ac Atrazine 90 DF on 5/5/14

Post: 48 oz/ac Buccaneer Plus on 6/14

Fertilizer: 10 gal/ac 10-34-0, 1 pt/ac Zinc chelate as starter in furrow, 110# actual N/acre as UAN 32%, and 1.5 qt/ton Agrotain ultra on 5/5/14.



Insecticides/Fungicides: Acceleron 250 seed treatment

Introduction: The purpose of this study was to evaluate two different hybrids at three different plant populations in 15" row spacing rainfed corn production. The cooperater also wanted to determine which planting rate was the most profitable. This is the fourth growing season for this study.

Results: Because there was no hybrid by population interaction these factors were analyzed separately.

Hybrid:	Yield† (bu/acre)	Moisture (%)	Net Return ‡
Channel 213-40VT3PRIB	191 A*	15.3% A	\$556.85
Channel 215-81VT2PRIB	185 B	14.4% B	\$542.37
<i>P-Value</i>	0.0349	0.0019	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn price, \$290/bag cost for Channel 215-81VT2PRIB, and \$308/bag cost for Channel 213-40VT3PRIB, and average seeding rate of 29,000 seeds/acre.

Population:	Yield† (bu/acre)	Moisture (%)	Net Return ‡
26,000 seeds/acre	183 B*	14.9% A	\$543.33
29,000 seeds/acre	187 B	14.9% A	\$546.11
32,000 seeds/acre	194 A	15.1% A	\$559.40
<i>P-Value</i>	0.0002	0.3835	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn price, and \$299/bag cost (average price of the two hybrids used).

Summary: Channel hybrid 213-40VT3PRIB was significantly higher yielding than Channel hybrid 215-81VT2PRIB. Although seed cost was higher for Channel 213-40VT3PRIB, the increased yield covered the additional seed cost and resulted in greater net return. There was a significant increase in yield when seeding rate was increased from 29,000 to 32,000 seeds/acre. The highest net return was seen for 32,000 seed/acre planting rate.

Rainfed Corn Population Study – Population by Management Zones

Study ID: 029053201401

County: Dodge

Soil Type: Moody Silty Clay Loam

Planting Date: 5/4/2014

Harvest Date: not available

Row Spacing: 36"

Hybrid: DKC 62-89

Reps: 4

Previous Crop: Soybeans

Tillage: No-till

Herbicides:

Pre: 4 oz/ac Balance Flexx, 1 qt/ac Atrazine 4L, and 1 pt/ac Parallel Plus on 4/15/14

Post: 3 oz/ac Laudis, 1 qt/ac Cornerstone Plus, and 0.5 pt/ac Atrazine 4L on 6/11/14

Fertilizer:

11-52-0 and 7#/ac Zinc sulfate fall applied

20 gal/ac UAN 32% pre-plant, 4/2014

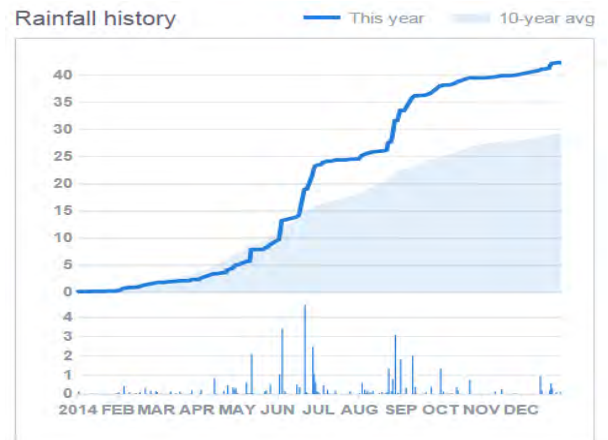
6 gal/ac 10-34-0 in furrow at planting

Insecticides/Fungicides: Cruiser 250 seed treatment

Note: Hailed 6/4/14

Irrigation: Not irrigated.

Rainfall:



Introduction: Management zones for this study were created using the USDA Management Zone Analyst Version 1.0 Software. This software helps to create management zones and test the number of zones that should be created in a field. A number of information sources were used to create management zones for this field including normalized historical corn yield maps from 2000 to 2010, deep EC, shallow EC, and elevation data. These data were averaged into an 8 meter grid. Using the software, the grower decided to use 3 management zones, however zone 3 was very small in area and so it was combined with zone 2. Zone 1 had shallow EC averaging 17.2 and zone 2 had shallow EC averaging 24.6. Zone 1 contained the wetter portions of the field while zone 2 contained the dryer portions of the field (Figure 1). Within zone 1 and zone 2, eight planting populations were evaluated. The objective was to determine if the zones preformed differently and if an optimum seeding rate could be identified for each zone.

What is electrical conductivity (EC)?

Electrical conductivity is the ability of a material to conduct an electrical current. The primary factors influencing the EC of soils are salt content, type and amount of clay, water, mineralogy, and soil temperature. For a non-saline soil, EC will primarily be driven by soil texture. Clay soils will have higher particle to particle contact and higher moisture holding capacity and are therefore highly conductive. Sandy soils have limited particle contact and low moisture holding capacity and are therefore extremely poor conductors. Electrical conductivity maps can serve as a proxy for OM, clay content and CEC.



Figure 1: Map of the 2 management zones. Zone 1 has average shallow EC of 17.2; zone 2 has average shallow EC of 24.6.

Results: The results were analyzed with a main-plot factor of zone and sub-plot factor of planting populations. There was no yield interaction between zone and population, therefore population and zone were analyzed separately. Table 1 shows the results for the 2 management zones. A hail storm in June resulted in stand loss and consequently the relationship between yield and planting population is not related to the initial planting rates. Additionally, the harvest stand counts did not correlate to the planting populations. Yield and moisture values for the planting population main effect are shown in table 2 with yields adjusted by a covariate of harvest stand counts. Additionally, the harvest population is compared to yield by zone in Figure 2.

Table 1: Yield, moisture, harvest population, and net return for the 2 management zones (values shown are averaged across all planting populations).

	Yield [†] (bu/acre)	Moisture (%)	Harvest Pop (plants/acre)	Net Return [‡]
Zone 1 (shallow EC averaged 17.2)	131 B	17.3% B	18,156 B	\$458.50
Zone 2 (shallow EC averaged 24.6)	165 A*	17.4% A	19,781 A	\$577.50
<i>P-Value</i>	<i>0.0059</i>	<i>0.0441</i>	<i>0.0941</i>	--

[†]Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

[‡]Net return based on \$3.50/bu corn price.

Table 2: Yield, moisture, harvest population, and net return for the 8 planting populations (values shown are averaged across both management zones).

	Yield†§ (bu/acre)	Moisture (%)	Harvest Pop (plants/acre)	Net Return ‡
23,200 seeds/ac	154 A*	17.3 AB	20,000 A	\$450.03
24,940 seeds/ac	154 A	17.4 AB	18,375 A	\$425.07
27,260 seeds/ac	144 A	17.4 AB	20,625 A	\$404.62
29,000 seeds/ac	143 A	17.4 AB	19,500 A	\$383.16
31,321 seeds/ac	140 A	17.3 B	16,875 A	\$331.21
33,600 seeds/ac	146 A	17.3 B	18,750 A	\$363.44
34,800 seeds/ac	153 A	17.4 AB	18,875 A	\$386.30
37,100 seeds/ac	151 A	17.5 A	18,750 A	\$365.93
<i>P-Value</i>	0.5155	0.0698	0.5180	--

†Bushels per acre corrected to 15.5% moisture.

§ Yield values are adjusted based on a covariate of harvest stand counts using the GLIMMIX procedure in SAS 9.4 (SAS Institute Inc., Cary, NC).

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn price and \$343/bag seed cost.

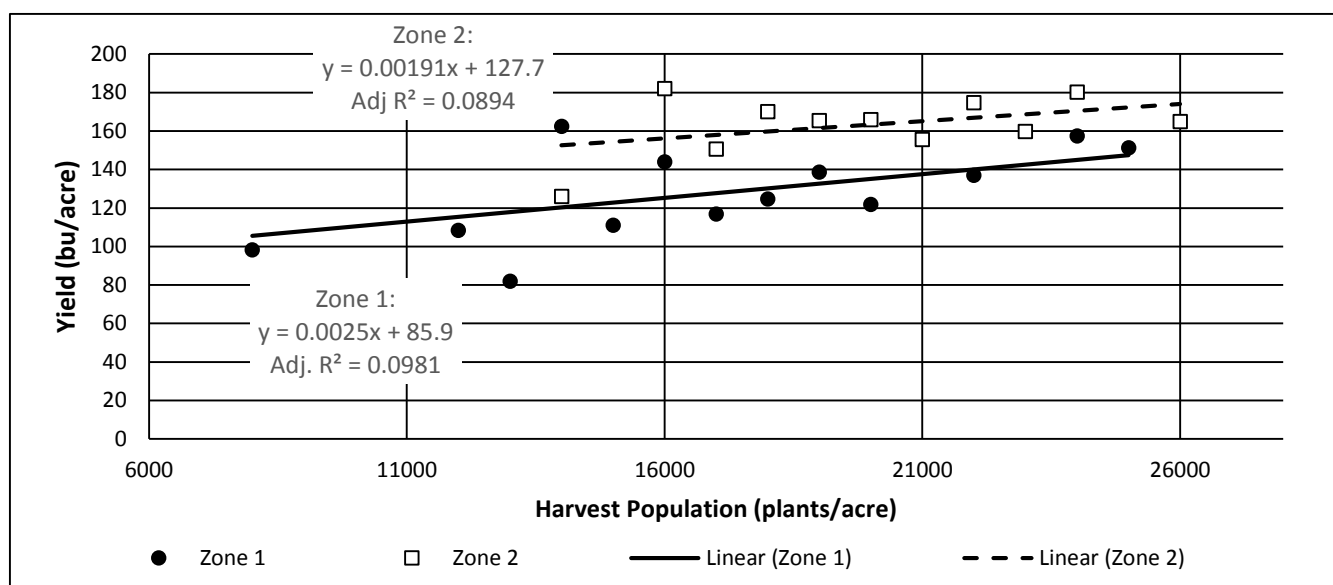


Figure 2: Yields compared to harvest populations separated by management zone.

Summary: Zone 2 was significantly higher yielding, had higher grain moisture at harvest, and had a higher final harvest population. A hail storm in June resulted in stand loss and consequently the relationship between yield and planting population is not related to the initial planting rates. There was no yield difference for planting populations of 23,200 seeds/ac to 37,100 seeds/acre for either zone. Some variations in moisture occurred across seeding rates but did not follow an explainable trend. Final harvest populations were not significantly different across all populations tested and did not correlate to the planting populations. When comparing yield to the harvest populations it appears that yield for zone 1 is more responsive to increasing plant population than zone 2. In zone 1 there is a 2.5 bu/acre increase for each 1000 additional plants/acre added and in zone 2 there is a 1.9 bu/acre increase for each 1000 additional plants/acre.

Rainfed Corn Population Study – Variable Rate Seeding

Study ID: 030109201401

County: Lancaster

Soil Type: Sharpsburg silty clay loam, Judson and Kennebec silt loam

Planting Date: 4/22/2014

Harvest Date: 10/26/2014

Row Spacing: 30"

Hybrid: P1498

Reps: 8

Previous Crop: Soybeans

Tillage: No-till

Herbicides:

Pre: 2.1 qt/ac Trizmet II Herbicide broadcast

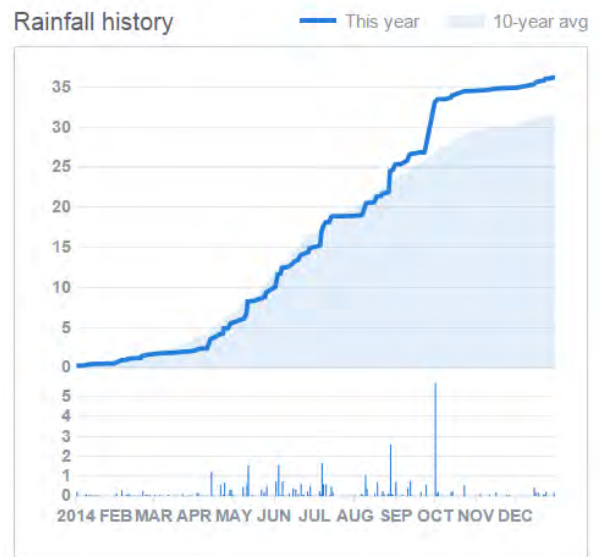
Post: 1.87 oz/ac Callisto and 24 oz/ac Roundup PowerMAX

Insecticides/Fungicides:

Poncho 1250, Raxil MD, Herculex I, Yield Gard Seed

Treatments

Fertilizer: 160#/ac anhydrous ammonia, Nov. 2013



Introduction: With the capability of planters to variable-rate seed, more farmers are trying this feature out in their fields. The technology holds promise as it can help increase return on investment of seed by putting more seeds where there is more potential for increased yield. The soil map for this field is shown in Figure 1. For this study, management zones were developed by using four years of historic yield maps (Figure 2). When the composite yield maps were compared to the soil series map for this field, similarities were seen. Management zones for variable-rate seeding (Figure 3) were based off of the composite yield map. Three seeding rates were used (24,000, 28,000 and 32,000 seeds/acre) in the variable rate prescription map. In order to evaluate the result of the variable-rate seeding, strips of a flat seeding rate of 28,000 seeds/acre were placed throughout the field. This design allowed for comparisons to be made between the flat seeding rate and variable seeding rate. The variable-rate seeding prescription resulted in equal amounts of the 3 rates of seed being planted with an overall average of 28,000 seeds/acre for the variable-rate strips. Because the same amount of seed was used on the variable-rate seeding areas and the flat rate seeding areas, the seed cost for the single rate and variable-rate areas was the same in this case. This 2014 on-farm research study attempted to answer the question “if developing production regions in the field based on soil type and planting variable rate corn populations in those regions was more profitable than planting a standard seeding rate per acre”?

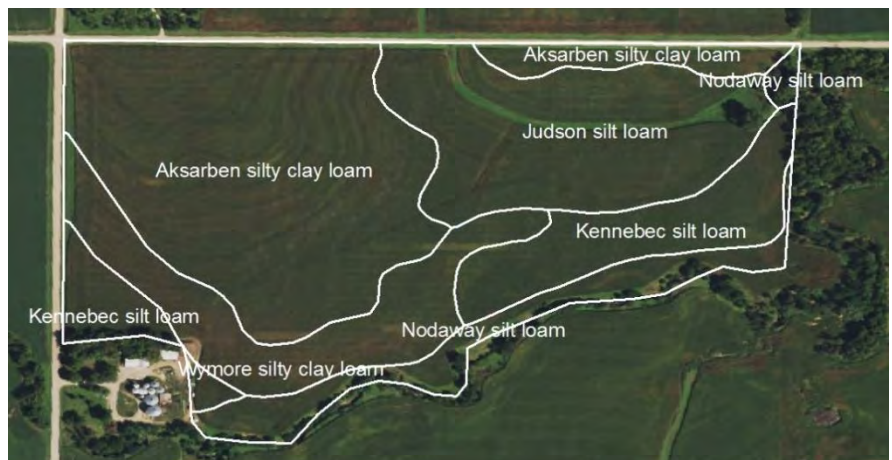


Figure 1. Soil series map for the field being studied.

Figure 2. Yield maps for 2010, 2011, 2012, and 2013 which were used to create a four year composite yield map.

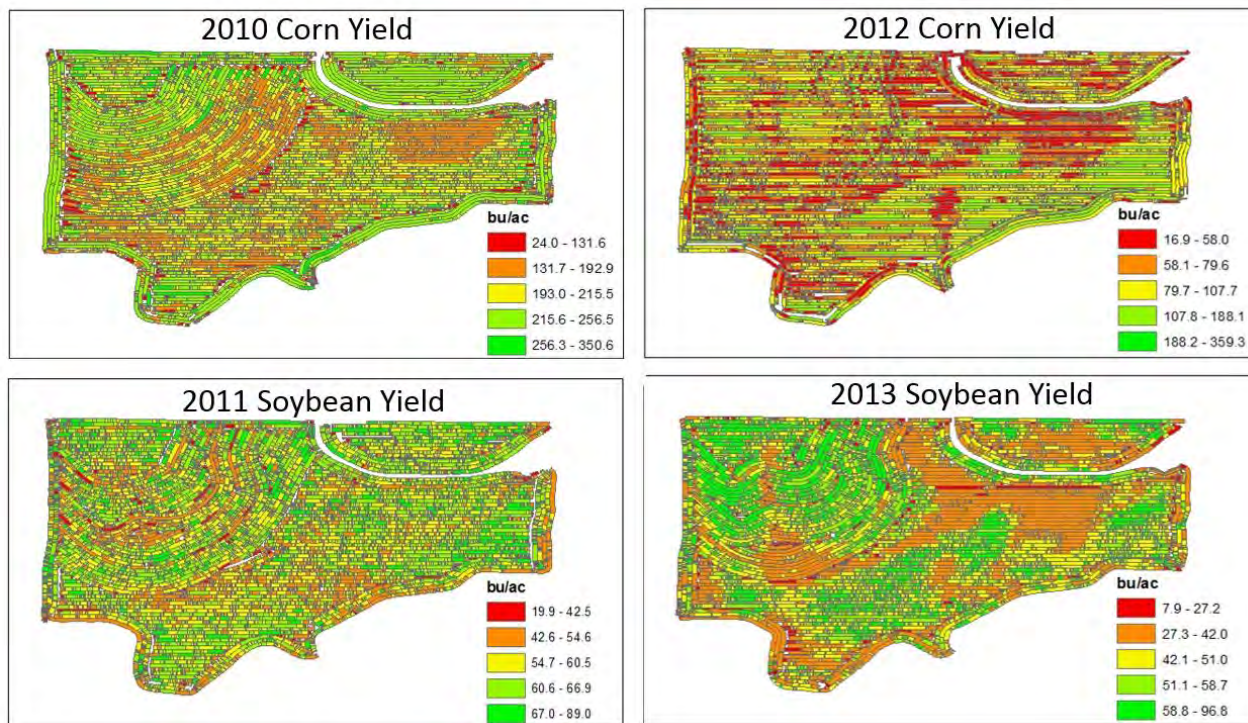
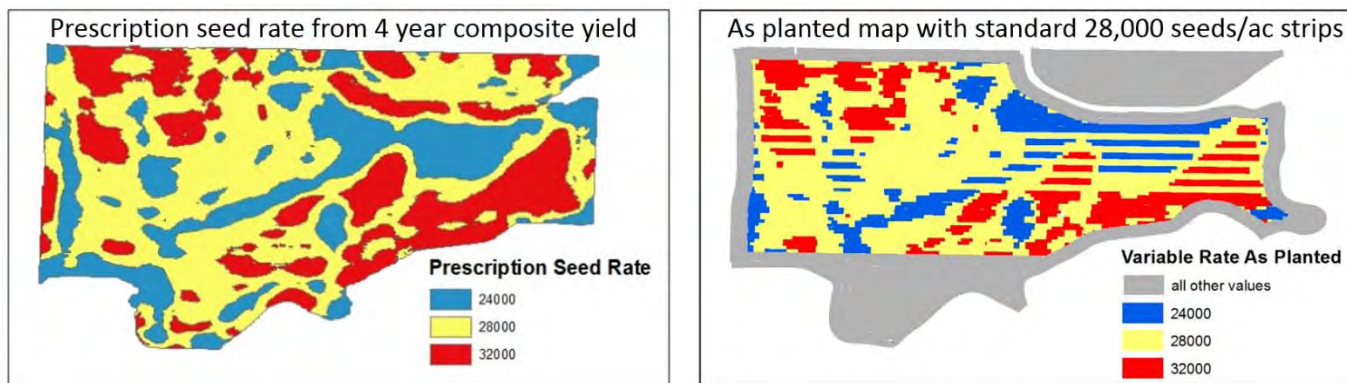


Figure 3. Prescription seeding rate based on four year composite yield (left) and as planted map showing strips of standard 28,000 seed/acre rate for evaluation (right).



Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
28,000 seeds/ac	204 A*	15.7 A	\$714.00
Variable Rate Seeding	203 A	15.7 A	\$710.50
<i>P-Value</i>	0.1631	0.7489	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn. Seed cost between treatments is the same and was therefore not taken into account.

Summary:

There was no significant yield difference between the variable rate seeding prescription and the standard 28,000 seeding rate. Moisture for the two treatments was also the same.

Variable Rate Seeding Guideline:

When setting up variable-rate seeding it is important to think carefully about how management zones are delineated and how the success of your management zones will be evaluated. Yield maps over time are an excellent starting place for developing management zones. Management zones should be areas that have consistent performance trends over years. Areas where field performance varies greatly from year-to-year, such as an area that performs well in dry years and poorly in wet years, will be a challenge to know how to manage variably. Soil series information is readily available, but should not be used alone to create management zones. The level of accuracy at which these maps were created is often inadequate for creating management zones. Soil series information can be used to supplement other information. Consider using remote sensing imagery or soil electrical conductivity to augment your yield information. Setting up a simple experiment such as this one could provide information to help you maximize the return of your seed investment.

Rainfed Corn Population Study – Variable Rate Seeding

Study ID: 003095201401

County: Jefferson

Soil Type: Crete, Morrill, Morrill-Jansen Silt Loam

Planting Date: 4/24/2014

Harvest Date: unknown

Row Spacing: 30"

Hybrid: Channel 213-40

Reps: 7

Previous Crop: Soybean

Tillage: No-till

Herbicides:

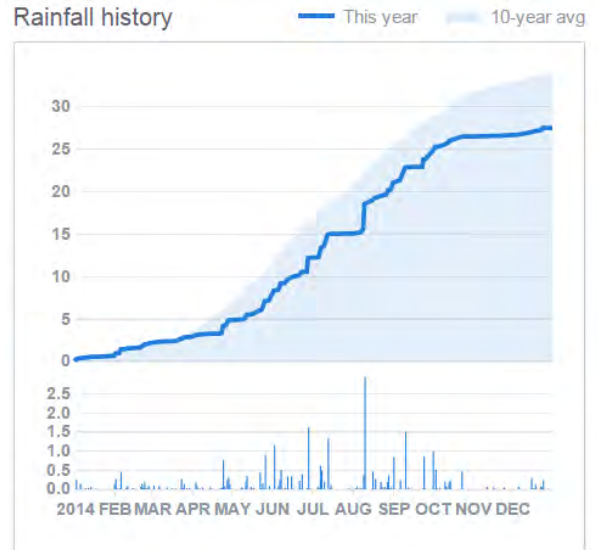
Pre: Glyphosate and 10 oz/ac 2,4-D LV6 on 4/12/14

Insecticides/Fungicides: Acceleron 250 seed treatment

Fertilizer:

105# N/ac as anhydrous ammonia on 11/5/13

5 gal 10-34-0 and 1 pt/ac Zinc chelate in furrow



Introduction: Four years of yield data (Figure 1) were used to create management zones for variable-rate seeding (Figure 2). Four seeding rates were used in the variable rate prescription map: 17,000, 21,000, 24,000, and 27,000 seeds/acre. In order to evaluate the result of the variable-rate seeding, strips of a flat seeding rate of 23,500 seeds/acre were placed throughout the field. The acreage for each population level is shown below. This 2014 on-farm research study attempted to determine if developing production regions in the field and subsequently planting variable rate corn populations in those regions was more profitable than planting a standard seeding rate per acre.

	Population	% of study area	Acres
Flat Rate	23,500	50%	8.5
Variable Rate	17,000	5%	0.92
	21,000	10%	64.2
	24,000	24%	73.3
	27,000	11%	82.5

Figure 1. Yield maps for 2008, 2009, 2010, and 2013 which were used to create management zones for planting.

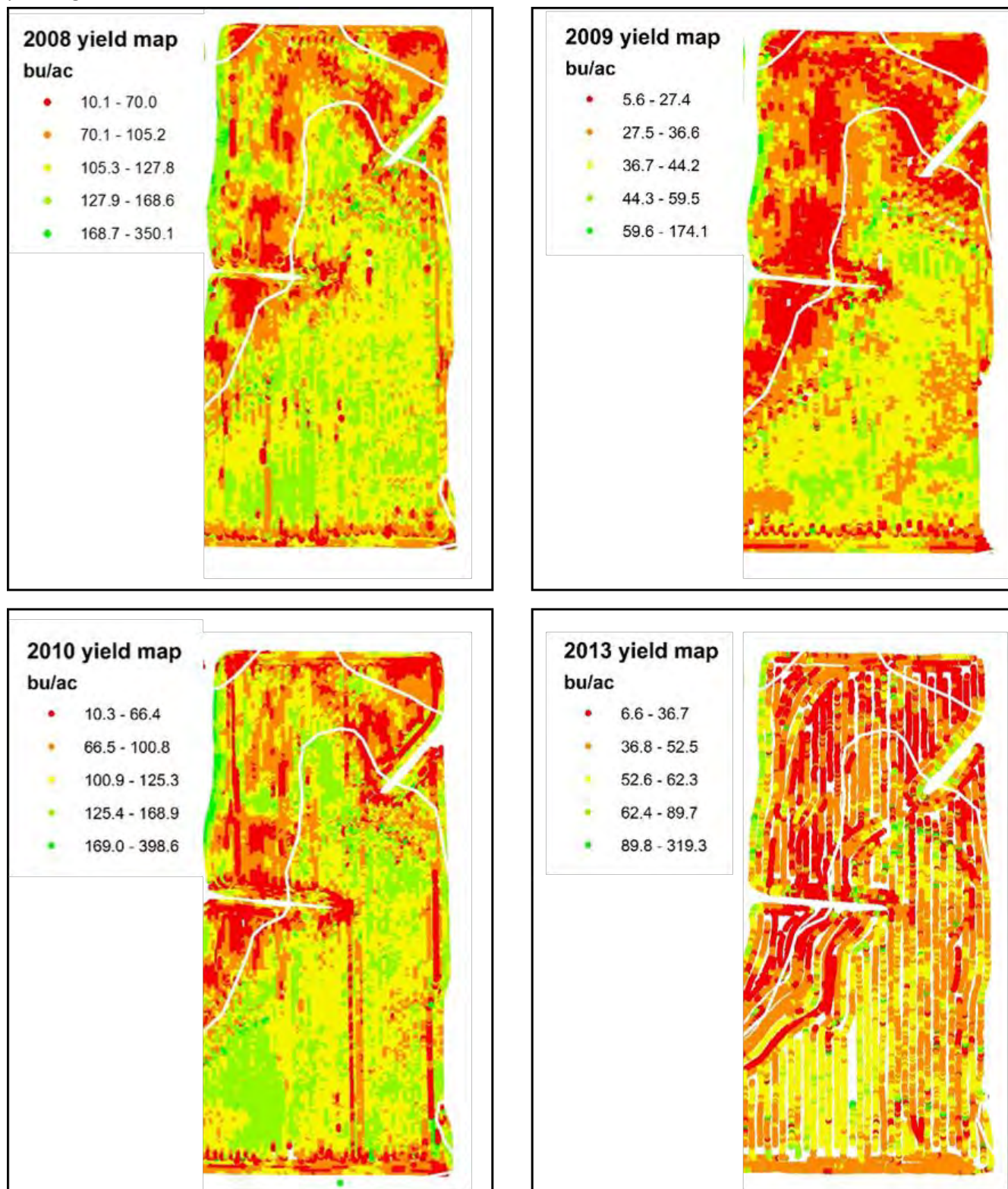
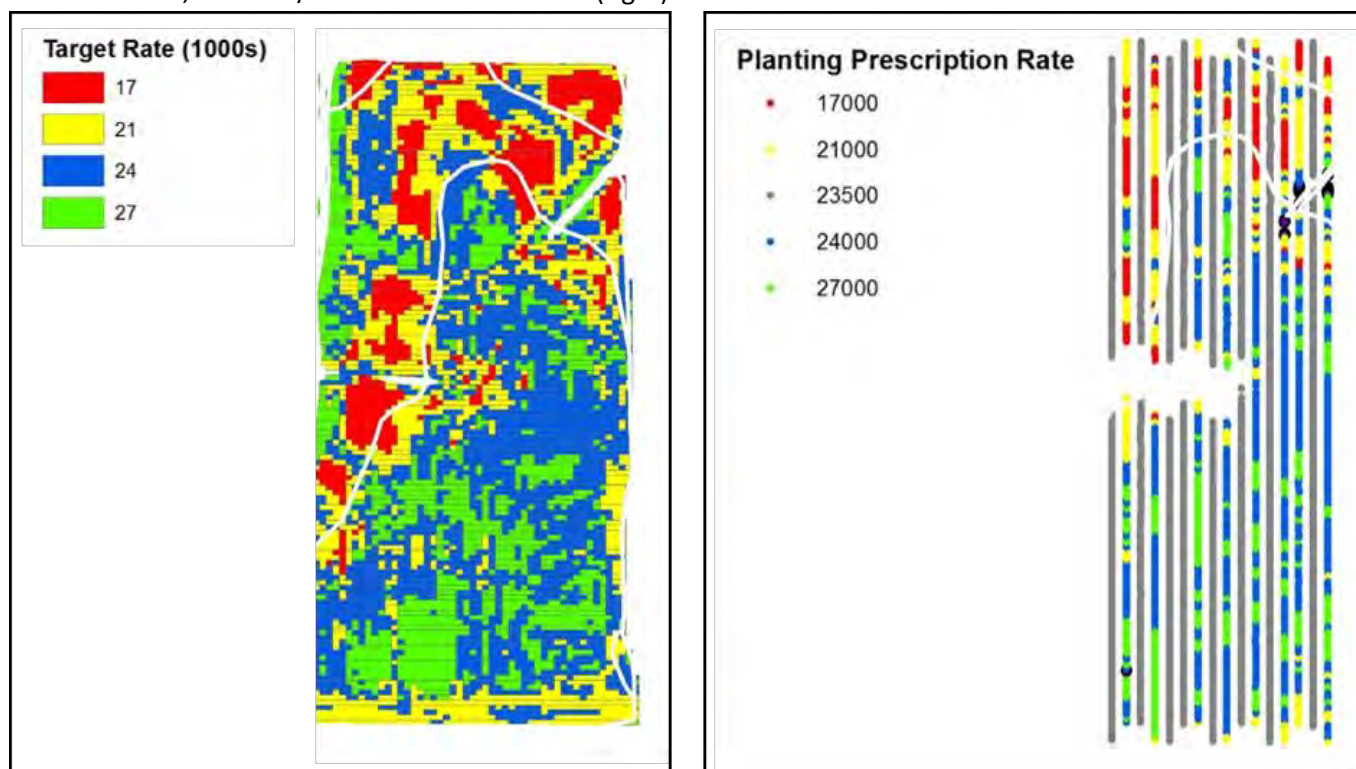


Figure 2. Prescription seeding rate based on four year composite yield (left) and as planted map showing strips of standard 23,500 seed/acre rate for evaluation (right).



Results:

	Yield [†] (bu/acre)	Moisture (%)	Seed Cost per acre	Net Return [‡]
Flat Rate	129 A*	13.3 A	\$71.81	\$379.69
VR seeding	131 A	13.2 A	\$71.19	\$387.31
<i>P-Value</i>	<i>0.1738</i>	<i>0.2308</i>	--	--

[†]Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

[‡]Net return based on \$244.45/bag

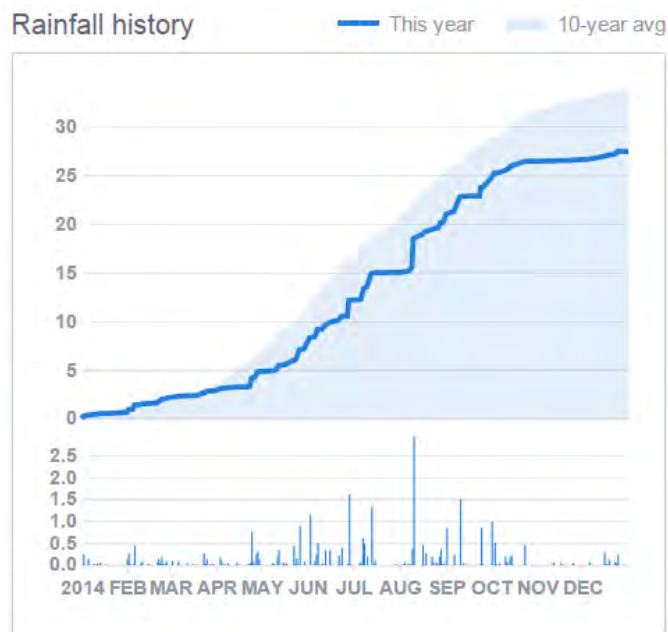
Summary: There was no significant yield difference between the variable rate seeding and the flat rate seeding.

Irrigated Corn Population Study

Study ID: 003095201402
County: Jefferson
Soil Type: Butler silt loam
Planting Date: 4/22/2014
Harvest Date: unknown
Row Spacing: 30"
Hybrid: Channel 215-52
Reps: 10
Previous Crop: Soybean
Tillage: No-till
Herbicides: Pre: Glyphosate and 10 oz/ac
 2,4-D LV6 on 4/10/14
Insecticides/Fungicides:
 Acceleron 250 seed treatment
Fertilizer:
 180# N/ac as anhydrous ammonia on 10/31/13
 5 gal/ac 10-34-0 on 4/22/14
 1 pt/ac Zinc chelate in furrow

Note: Frost in May and green snap resulted in total of 10% loss

Irrigation: pivot irrigated on 7/20, 7/24, 7/29, 8/3, and 8/6 for a total of 5".



Introduction: This on-farm research study is a continuation from the 2013 growing season. The purpose of this study was to determine the most profitable irrigated corn plant population. An additional planting rate of 44K seeds/acre was added to the 2014 test.

Results:

	Yield† (bu/acre)	Net Return ‡
32,000 seeds/ac	227 B*	\$693.26
36,000 seeds/ac	230 AB	\$691.11
40,000 seeds/ac	243 A	\$723.95
44,000 seeds/ac	244 A	\$714.80
<i>P-Value</i>	<i>0.0205</i>	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu and \$253.09/bag.

Summary: Yield increased as seeding rate increased. The highest net returns were at the 40,000 seeds/acre rate.

Irrigated Corn Population Study: Seed Rate by Hybrid

Study ID: 004053201401

County: Dodge

Soil Type: Moody silty clay loam

Planting Date: 4/26/2014

Harvest Date: 10/30/2014

Row Spacing: 30"

Reps: 5

Previous Crop: Corn

Tillage: Minimum

Herbicides: Pre: 2 qt/ac Keystone LA on 4/22/14

Post: 22 oz/ac Roundup PowerMAX, 0.5 oz/ac Armezon, and 0.5 lb/ac Atrazine 4L on 6/2/14

Insecticides/Fungicides:

Poncho 500 seed treatment

6 oz/ac Capture LFR at planting

2.5 oz/ac Stratego YLD at V5 (6/2/14)

4 oz/ac Priaxor at V16 (7/3/14)

10 oz/ac Headline AMP at brown silk (8/5/14)

Irrigation: Pivot irrigated

Fertilizer:

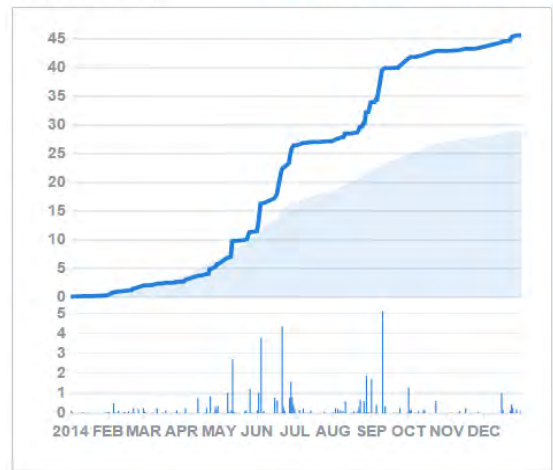
110# 11-52-0 with 6# Zn, Fall 2013

3 gal 12-0-0-26, 20 gal/acre UAN 32% with 2 qt Keystone LA on 4/22/14

5 gal/acre 10-34-0 at planting

40 gal/acre UAN 32% side-dress mid-June

Rainfall history — This year — 10-year avg



Introduction: Seed companies conduct product development research on plant population response for future hybrid releases to help make hybrid specific plant population recommendations for producers. Utilizing company information to adjust seeding rates higher or lower than your average seeding rate could be an agronomic and economic benefit. In this study, two 113-114 day hybrids with differing responses for plant population were selected. Hybrid 8389 is characterized as a hybrid with ability to perform well at lower to moderate populations while 8331 has shown to perform well at higher populations. The purpose of this study was to assess the corn plant population by hybrid interaction.

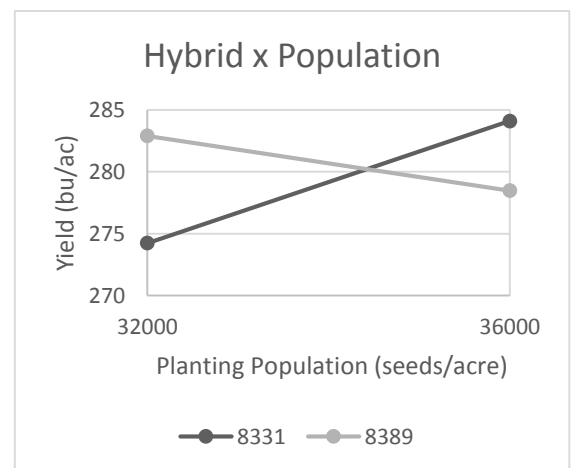
Results: There is a hybrid by population interaction so the two factors are analyzed together.

	Yield† (bu/acre)	Net Return ‡
H 8389 + 32,000 seeds/acre	283 AB*	\$880.50
H 8331 + 32,000 seeds/acre	274 B	\$849.00
H 8331 + 36,000 seeds/acre	284 A	\$870.25
H 8389 + 36,000 seeds/acre	278 AB	\$849.25
P-Value	0.0922	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu corn and \$275/bag seed.



Summary: For hybrid H 8331, increasing seeding rate from 32,000 to 36,000 seeds/acre resulted in a significant yield increase. For hybrid H 8389 there was no yield difference between the 32,000 and 36,000 seeding rates. At a given population level there was no significant yield difference between the two hybrids.

Nebraska Extension: Nebraska On-Farm Research Network

Soybean Planting Population Summary (2010-2013)



120,000 plants/acre



150,000 plants/acre

With increasing seed input costs, Nebraska producers wanted to evaluate what planting population would be the most profitable. The Nebraska On-Farm Research Network conducted a number of studies investigating the effects of soybean planting rate on yield, plant height, pods per plant, and nodes per plant. Table 1 shows year and location for 13 of these sites along with the yield at the four planting rates tested. All of these sites had 30" row spacing and were irrigated.

Table 1: Site year and county with yield at four planting populations tested.

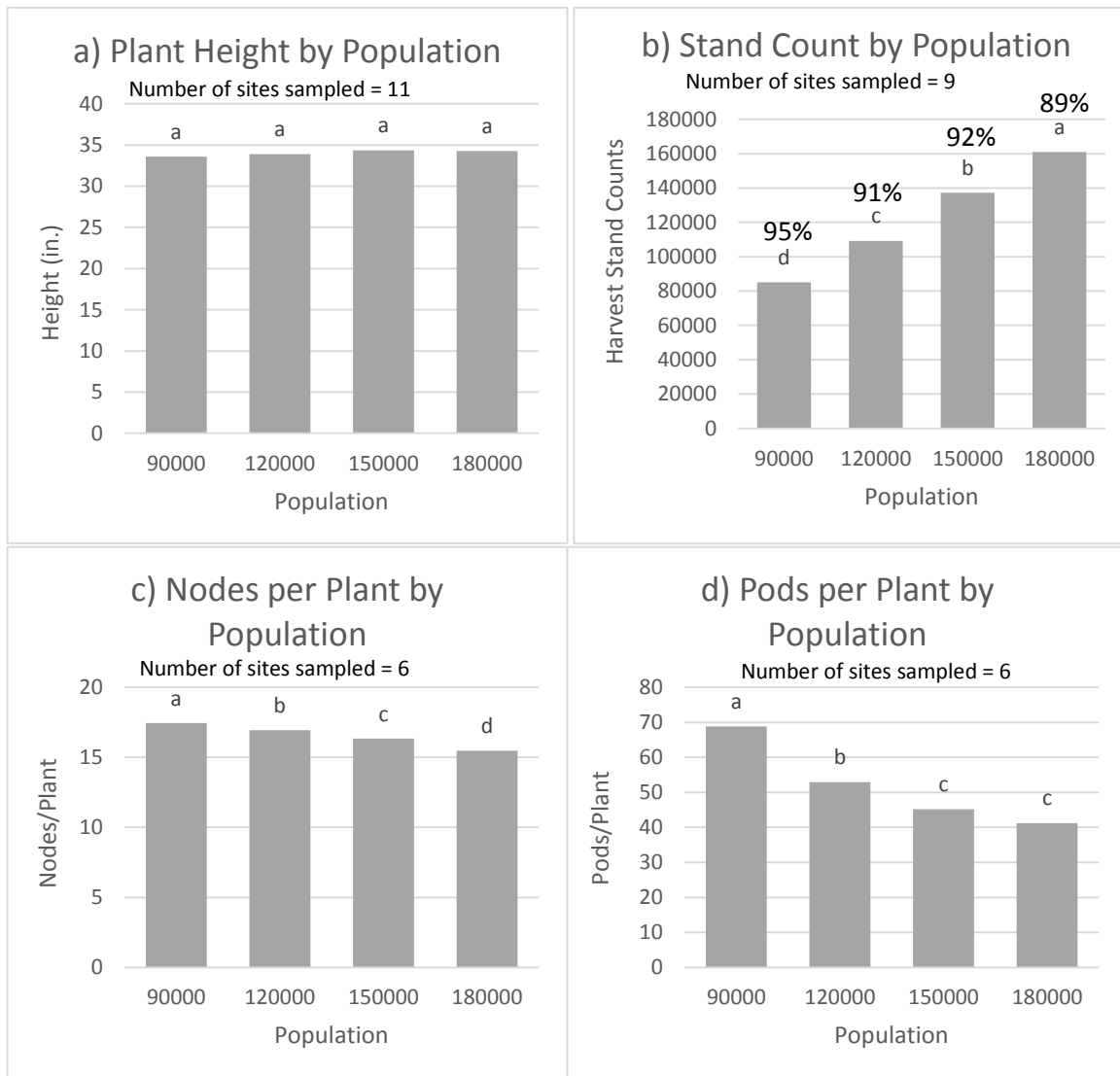
Site	Year	County	Planting Population (seeds/acre)			
			90000	120000	150000	180000
1	2006	Fillmore	66 B	66 AB	68 A	69 A
2	2006	Seward	65 A	66 A	65 A	66 A
3	2007	Hamilton	53 A	52 A	51 A	53 A
4	2007	York	61 A	62 A	62 A	63 A
5	2007	Clay	61 A	61 A	61 A	62 A
6	2007	Fillmore	56 A	58 A	58 A	59 A
7	2007	Seward	63 A	64 A	63 A	63 A
8	2008	Fillmore	77 B	77 AB	78 A	78 A
9	2008	Seward	66 B	67 A	68 A	68 A
10	2008	Hamilton	69 A	70 A	71 A	71 A
11	2008	York	68 B	70 AB	71 AB	72 A
12	2008	Clay	66 A	65 A	69 A	68 A
13	2008	Clay	65 A	70 A	63 A	65 A
Average			64.4 C	65.2 B	65.4 AB	65.8 A

* Significance letters apply within site and year. Values with the same letter are not significantly different at a 90% confidence level.

For 9 of the 13 sites there was no significant yield increase for increasing plant population from 90,000 to 180,000 seeds/acre. Over all the sites averaged together, there was a significant increase in yield when seeding rate was increased. However, increasing seeding rate from 90,000 to 150,000 seeds/acre resulted in an additional 1 bu/acre yield. At a seed cost of \$60/140,000 seeds, an additional 60,000 seeds would cost \$25.71/acre; at current grain prices, the 1 bu/acre yield increase would not cover this additional seed cost.

There was no significant difference in plant height as seen in Figure 1.a. The harvest stand count is shown in Figure 1.b. The percentage of seeds planted that were present at harvest are shown above each bar; the highest percentage was for the 90,000 seeds/acre planting rate. Figure 1.c. shows the nodes per plant by population; the 90,000 seeds/acre treatment had the most nodes per plant while the 180,000 seeds/acre treatment had the lowest nodes per plant. Figure 1.d. depict the pods per plant by population; the 90,000 seeds/acre treatment had the most pods per plant.

Figure 1: Plant height, stand count, nodes per plant, and pods per plant by population.



Nebraska producers were asked what their soybean planting population was. Responses from 613 producers attending pesticide certification training in York, Seward, Polk, and Buffalo Counties showed that 82% of respondents planted 150,000 seeds/acre or greater (Figure 2). Similarly in a CropWatch survey of 181 participants, 81% responded that they planted 140,000 seeds/acre or greater (Figure 3).

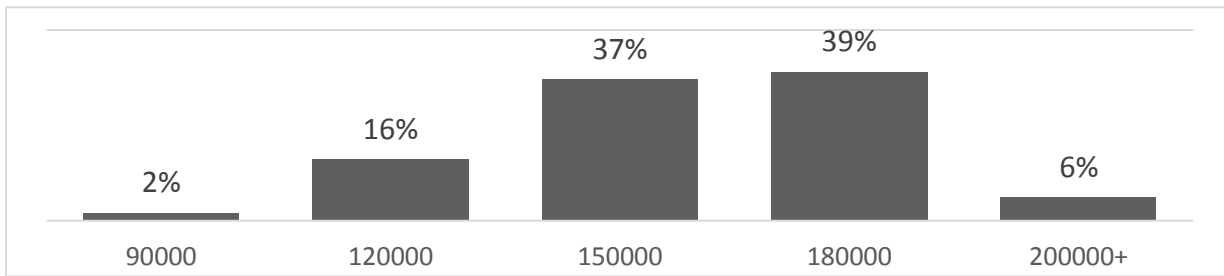


Figure 2: Responses from 613 respondents attending pesticide certification training in York, Seward, Polk, and Buffalo Counties when asked what population they planted their soybeans.

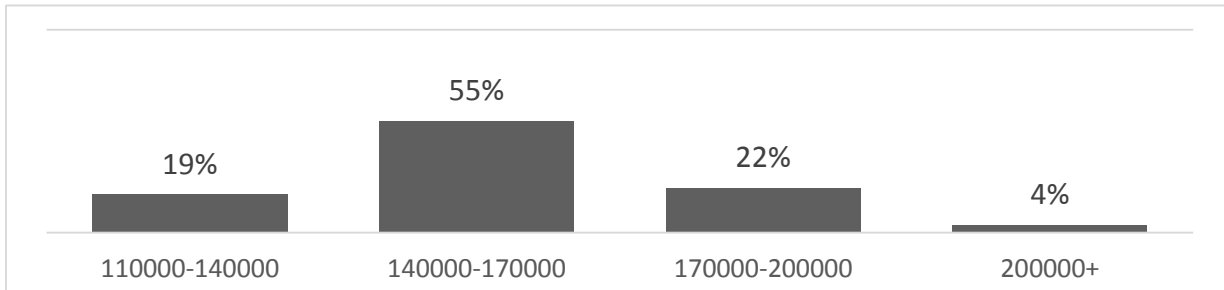
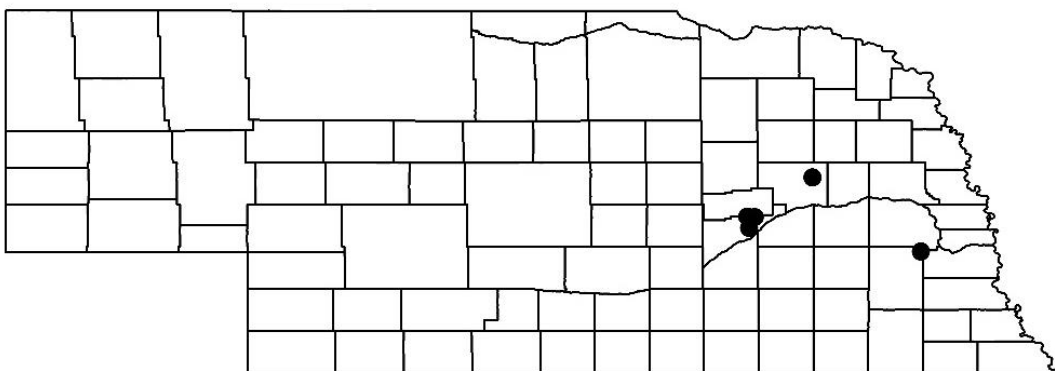


Figure 3: Responses from 181 participants in a CropWatch survey (May 2014) when asked what population they planted their soybeans.

When stands are thinner, soybeans have the propensity to flex or increase yield components of pods per plant, seeds per pod, and seed size. Additionally, the most economic soybean planting rate studied was 90,000 seeds/acre. Based on these results and the results from surveys, many Nebraska producers could decrease their planting populations and increase profitability.

In 2014, four sites looked at optimal soybean planting populations. The locations of these studies are shown below.

2014 Soybean Population Study Locations:



Rainfed Soybean Population Study

Study ID: 028109201402

County: Lancaster

Soil Type: Aksarben silty clay loam

Planting Date: 5/19/2014

Harvest Date: 10/17/2014

Row Spacing: 20"

Hybrid: Asgrow 34-32 RR

Reps: 5

Previous Crop: Corn

Tillage: No-till

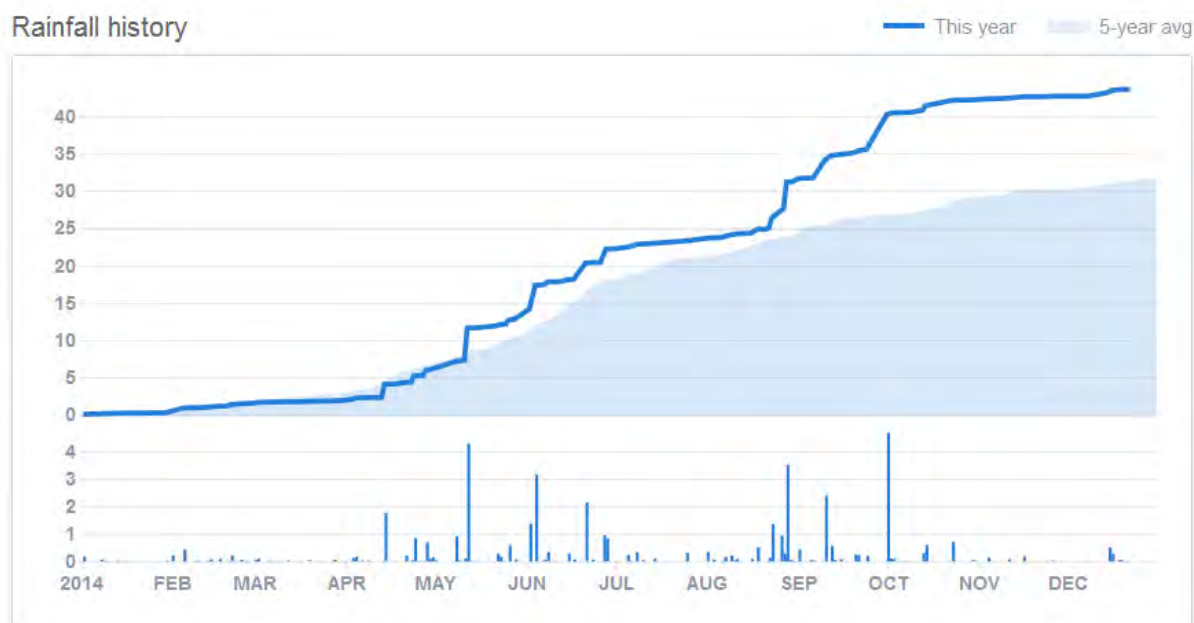
Herbicides:

Pre: Authority XL, Anthem, Sharpen, 2,4-D LV6, Roundup PowerMAX

Post: Roundup PowerMAX, Fusilade

Insecticides/Fungicides: Fungicide seed treatment

Rainfall history



Introduction: The purpose of this study was to determine the most profitable rainfed soybean seeding rates. The population chosen in this study are commonly used by growers in Eastern Nebraska.

Results:

	Yield† (bu/acre)	Moisture (%)	Harvest Pop	Net Return ‡
120,000 seeds/ac	64 A*	11.2 A	101,200 C	\$598.88
150,000 seeds/ac	63 A	11.4 A	125,600 B	\$578.23
180,000 seeds/ac	64 A	11.3 A	144,200 A	\$577.87
<i>P-Value</i>	<i>0.8827</i>	<i>0.3773</i>	<i>0.0005</i>	---

†Bushels per acre corrected to 13.0% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$10/bu soy, \$48.32/unit seed (140K spu).

Summary: There was no significant yield difference for populations studied. Based on the cost of seed the most economical planting population was 120,000 seeds per acre.

Irrigated Soybean Population Study

Study ID: 002121201401

County: Merrick

Soil Type: Fonner sandy loam

Planting Date: 5/6/2014

Harvest Date: Unknown

Row Spacing: 30"

Hybrid: Pioneer 93Y16

Reps: 4

Previous Crop: Corn

Tillage: Vertical

Herbicides:

Pre: 5oz/ac Anthem and 32oz/ac Durango on 5/30/2014

Post: 16oz/ac Ultra Blazeron, 32oz/ac Durango, and 1qt/ac Plen-T-Sweet on 7/2/2014

Insecticides/Fungicides:

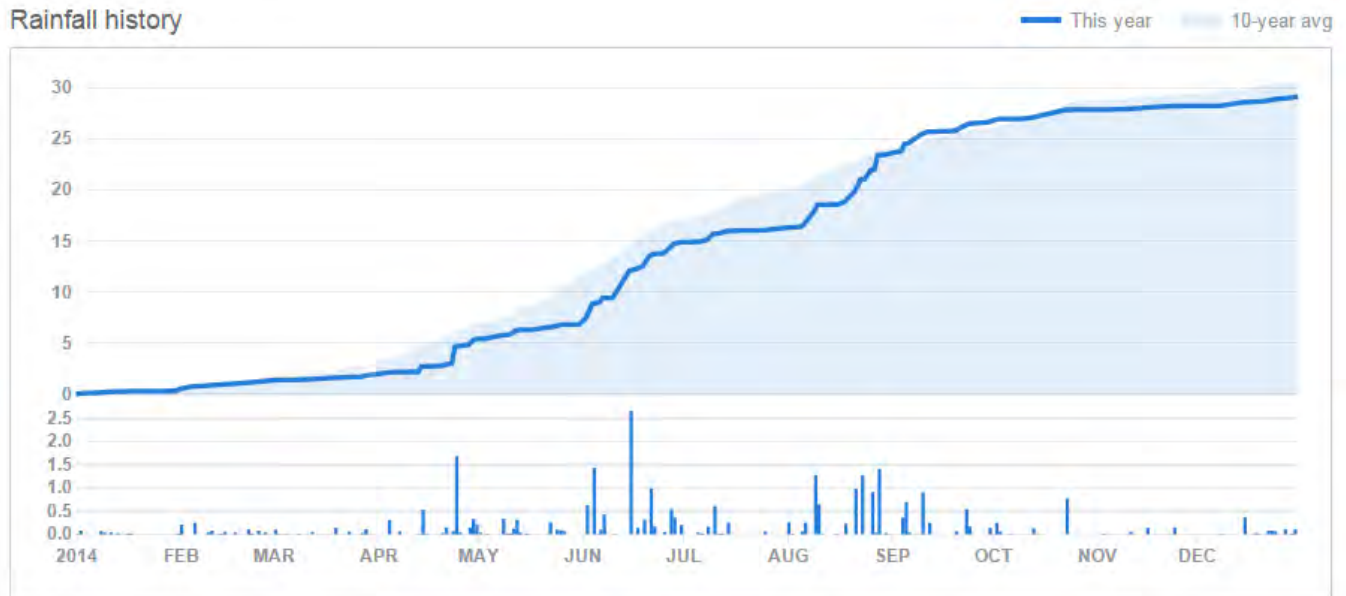
Poncho/VOTIVO, Evergol Energy

Fertilizers:

70 lbs/ac 11-52-0, 95 lbs/ac K-Mag, and 47 lbs/ac Pel-Lime on 2/25/2014

Irrigation: Pivot

Rainfall history



Results:

	Yield† (bu/acre)	Moisture (%)	Net Return ‡
120,000 seeds/ac	71 A*	12.8 A	\$658.57
150,000 seeds/ac	72 A	12.8 A	\$655.71
180,000 seeds/ac	72 A	12.6 B	\$642.86
<i>P-Value</i>	0.7733	0.0062	--

†Bushels per acre corrected to 13.0% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$10/bu soybeans and \$60/unit seed (140,000 seeds).

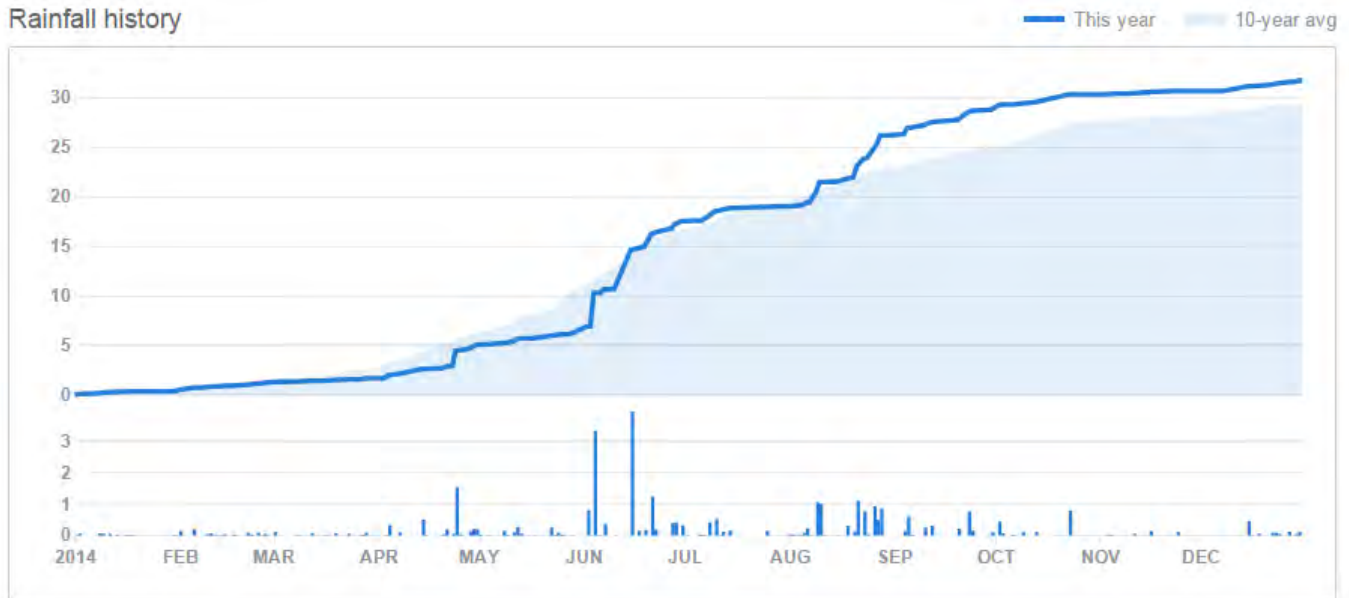
Summary: There was no significant difference in yield for the three populations tested. The 180,000 seeds/acre rate was significantly dryer than the other two seed rates tested. The highest net returns were obtained from the 120,000 seeds/ac rate.

Irrigated Soybean Population Study

Study ID: 021121201401
County: Merrick
Soil Type: Leshara silt loam
Planting Date: 5/22/2014
Harvest Date: Unknown
Row Spacing: 30"
Hybrid: Channel 2559 RR

Reps: 3
Previous Crop: Corn
Tillage: Conventional
Herbicides:
Pre: 2 oz/ac OpTill on 5/20/2014
Post: 32 oz/ac Roundup WeatherMax on 5/20/2014
Insecticides/Fungicides: Poncho/VOTiVO, CruiserMaxx
Irrigation: Pivot

Rainfall history



Results:

	Yield† (bu/acre)	Net Return ‡
90,000 seeds/ac	71 B*	\$658.57
120,000 seeds/ac	78 A	\$715.71
150,000 seeds/ac	78 A	\$702.86
<i>P-Value</i>	<i>0.0184</i>	--

†Bushels per acre are NOT corrected to dry yield. Moisture values not available.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$10/bu soybeans and \$60/unit seed (140,000 seeds).

Summary: The 150,000 seeds/ac treatment was significantly higher yielding than the 120,000 seeds/ac treatment. There was no additional increase in yield for planting 180,000 seeds/ac. Of the populations tested, the highest net returns were at the 150,000 seeds/ac treatment level.

Irrigated Soybean Population Study

Study ID: 021121201402

County: Merrick

Soil Type: Blendon sandy loam

Planting Date: 5/23/2014

Harvest Date: Unknown

Row Spacing: 30"

Hybrid: Channel 2559 RR

Irrigation: Pivot

Reps: 3

Previous Crop: Corn

Tillage: Conventional

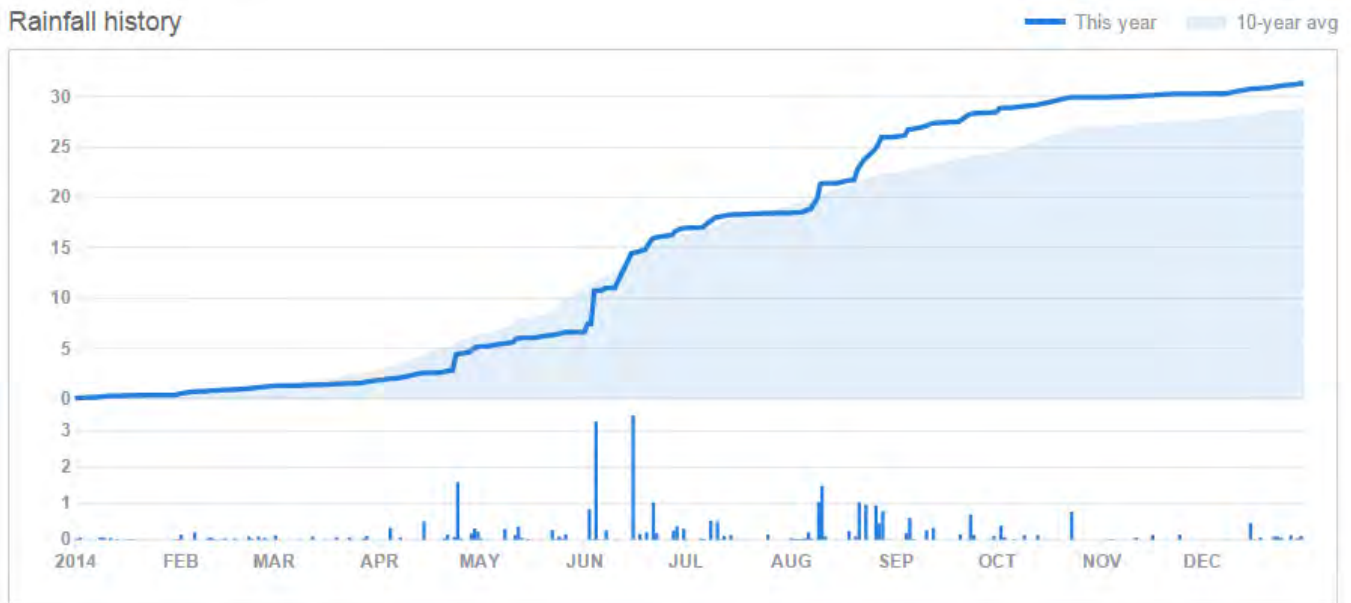
Herbicides:

Pre: 2 oz/ac OpTill on 5/20/2014

Post: 32 oz/ac Roundup WeatherMax on 6/23/2014

Insecticides/Fungicides: Poncho/VOTiVO, CruiserMaxx

Rainfall history



Results:

	Yield† (bu/acre)	Net Return ‡
90,000 seeds/ac	60 A*	\$561.43
120,000 seeds/ac	66 A	\$608.57
150,000 seeds/ac	68 A	\$615.71
<i>P-Value</i>	0.2533	--

† Bushels per acre are NOT corrected to dry yield. Moisture values not available.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$10/bu soybeans and \$60/unit seed (140,000 seeds).

Summary: There was no statistical yield difference between the planting populations tested.

Irrigated Soybean Replant into a Thin Stand

Study ID: 035141201401

County: Platte

Soil Type: Nora-Crofton-Moody silty clay loam

Planting Date: 5/10/2014

Harvest Date: 10/23/2014

Population: 145,000

Row Spacing: 15"

Hybrid: Hoegemeyer 2993 NRR

Reps: 5

Previous Crop: Corn

Tillage: No-till

Herbicides:

Pre: Fierce

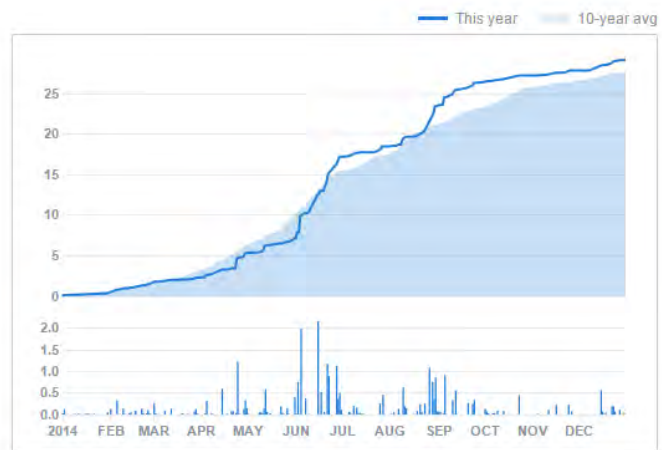
Post: Roundup PowerMAX and Select Max on 6/12/2014

Insecticides/Fungicides:

Guacho, Evergo Energy, PA2030 Biological

Irrigation: Pivot

Rainfall:



Introduction: The irrigated field was originally planted on May 10 at a population of 145,000 seeds/acre at a depth of 1.25 to 1.5 inches. The field was coming out of 6 years of continuous corn and was planted in a no-till environment. Cool soil temperatures combined with heavy residue contributed to poor seedling emergence. On June 11, the stand count was around 75,000 plants/acre with an estimated 5,000 to 10,000 seeds/acre having potential to emerge. The field was originally planted diagonally in 15 inch row spacing. On June 11, 5 replications of field length strips were replanted in 30 inch row spacing at a diagonal to the existing rows. The replant seeding rate was 145,000 seeds/acre. By late August, the non-replanted areas had filled in and the stand appeared to be adequate.

Results:

	Yield† (bu/acre)	Moisture (%)	Harvest Pop	Net Return ‡
Original	58 A*	10.6 B	138,497 B	\$580.00
Re-plant	57 A	10.9 A	235,267 A	\$545.00
<i>P-Value</i>	0.2559	0.0892	0.0021	

†Bushels per acre corrected to 13.0% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

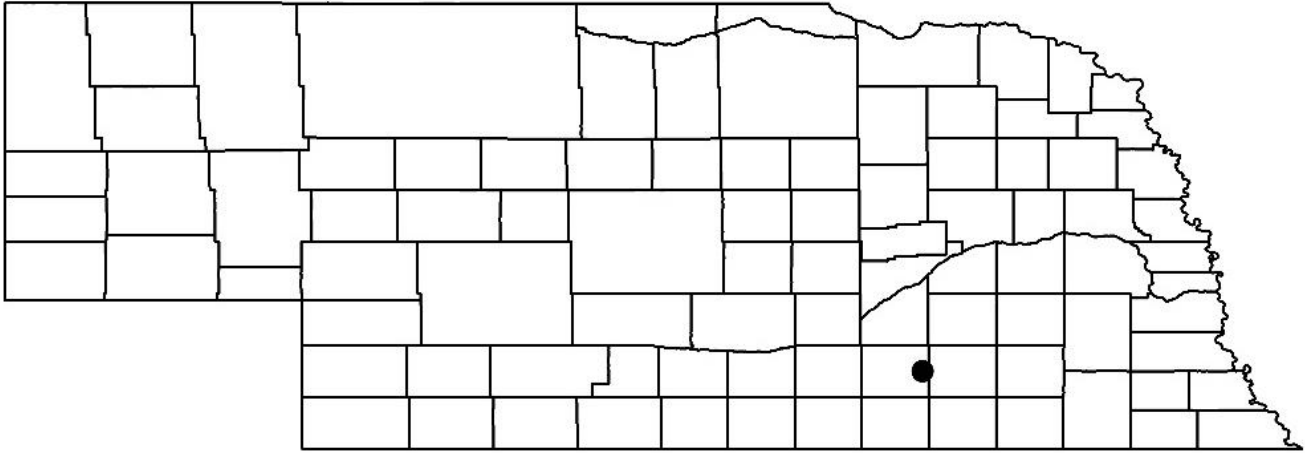
‡Net return based on \$10/bu and \$25/ac replant cost (no additional seed cost, 100% replant coverage policy for loyal customers).



Summary: The final population for the original stand ended up being much higher than that stand count on June 11. The sufficient population for the original planted soybean treatments resulted in no additional yield gain for the replanted areas.

Polymer on Corn Study

Polymer on Corn Study Location:



Polymer on Corn

Study ID: 011035201401

County: Clay

Soil Type: Hastings and Butler silt loam

Planting Date: 4/21/2014

Harvest Date: 11/3/2014

Population: 19,000

Row Spacing: 30"

Hybrid: DKC 65-66

Reps: 4

Soil Test Values: not available

Previous Crop: Corn

Tillage: No-Till

Herbicides:

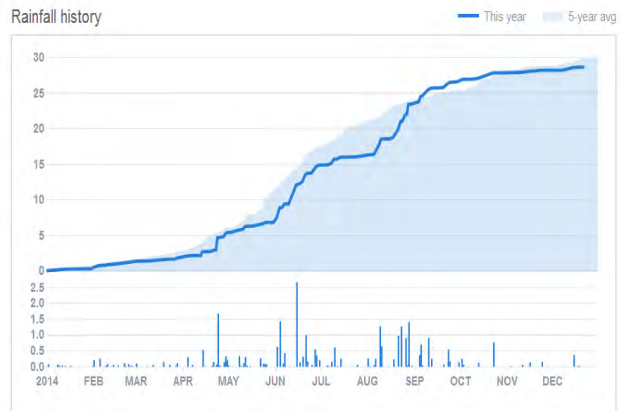
Pre: 1.5 qt/ac Lexar EZ, 3.6 pt/ac Halex GT on 4/22/14

Post: Unknown

Insecticides/Fungicides: none

Fertilizer: 130 lb UAN 32%, 5 gal 10-34-0, and 1 pt Zn-EDTA on 4/22/14

Irrigation: Not irrigated



Introduction: These producers were asked to try an experimental polymer product used in the fracking industry on corn. The objective was to determine any yield effects of this polymer product (called Agra-213) on corn. The company desired 90lbs per acre of this product to be applied but we were given a smaller amount and it was a granular product. The product was applied with a lawn spreader and we measured the applied product to be 2.5 lbs per 20' of row. The product was applied to four rows at 20' lengths in a paired comparison design. The technical data sheet for the product is supplied to the right.

TECHNICAL DATA SHEET

Agra-213 Product Line

PRODUCT OVERVIEW/DESCRIPTIONS: Soil Conditioner-Nutrient Supplement

Soil quality continues to degrade over many parts of the country. Various additives have depleted the natural microbial population, which are necessary to process nutrients (N-P-K) in order for them to be available for uptake into plants and crops. As a result, overuse of conventional fertilizers occurs, which causes other soil issues such as salt and phosphate build-up, not to mention the added cost.

The AGRA-213 products are a blend of a number of **exclusive** components designed to correct soil problems and provide basic nutrient requirements of plants and crops. The primary ingredients include the following:

- A proprietary humic acid extract, 98.5% Pure, 100% Active
- A blend of essential soil microbes, 39.8-54.6 billion Cfu's/Gallon
- Byo-Gon's Patented Microbial accelerant

The products are designed specifically for Agricultural and Home garden applications. They have the following benefits:

- Detoxifies the soil from the full spectrum of accumulated toxins associated with conventional fertilizers and regular chemical products.
- Increases plant beneficial microbes within the soil
- Serves as an effective chelating agent, magnifying the availability of vital plant nutrients, including nitrogen, calcium, phosphorus, potassium and trace minerals.
- Increases nutrient and water storage through more efficient cellular uptake
- Improve organic soil structure through humic acid technology
- Reduces disease pressure via beneficial microbial activity that breaks down both carbohydrates and protein components of harmful bacteria and disease pathogens.
- Contains food grade ingredients that are safe for use around animals, fish and humans



Figure 1: Product being applied with lawn spreader.



Figure 2: Applied product on corn.

Results:

	Yield† (bu/acre)	Stalk Rot (%)	Harvest Pop
Check	165 A*	1.3 A	17,500 A
Agra-213	170 A	2.5 A	17,125 A
P-Value	<i>0.8569</i>	<i>0.3910</i>	<i>0.6500</i>

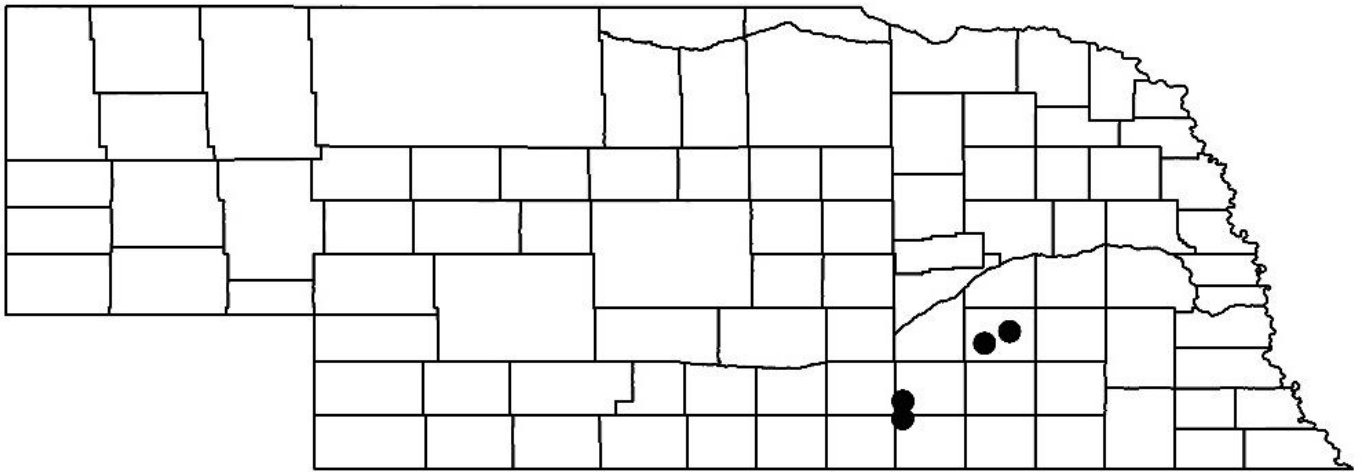
†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

Summary: There were no statistical significances between Agra-213 and the check treatment for yield, stalk rot, or stand counts. There is also no cost analysis for this product as it is an experimental product and not available on the market.

Sugar Studies

Sugar Study Locations:



Sugar on Corn

Study ID: 038035201402

County: Clay

Soil Type: Hastings silt loam

Planting Date: 5/3/2014

Harvest Date: Unknown

Population: 34,000

Row Spacing: 30"

Hybrid: DK 63-07

Reps: 5

Previous Crop: Corn

Tillage: Ridge till, stalks shredded 4/25/2014

Herbicides:

Pre: None

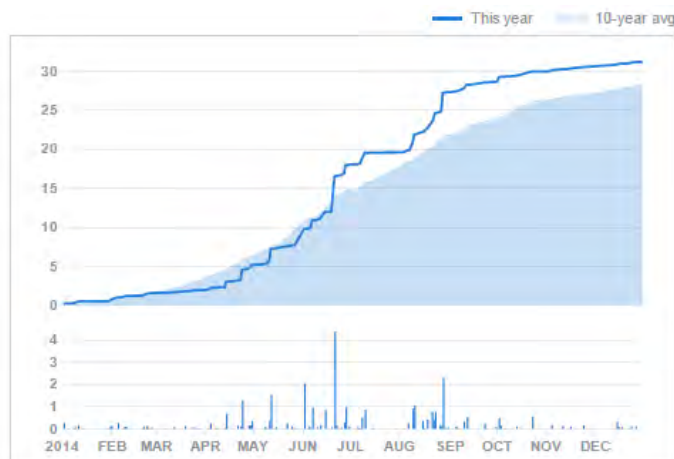
Post: 1 qt/ac Roundup PowerMAX and 1 qt/ac TripleFLEX on 5/26/2014

Insecticides/Fungicides: Acceleron

Fertilizers: 6 gal/ac 10-34-0 in furrow, 229 lb/ac 46-0-0, 50 lb/ac 11-50-0, 15 lb/ac sulfur, 3 lb/ac zinc broadcast.

Irrigation: Furrow irrigation, amount unknown.

Rainfall:



Introduction: This is the fourth year these producers have applied sugar to their corn fields in which their objective was to determine the impact of sugar application on corn yield, economics, and standability. In 2010-2011, 3 pounds of granulated sugar/acre in 10 gallons of water was applied at the V7-V8 time-frame. In 2013, 3 qts of Plen-T-Sweet/acre was added to 10 gallons of water and applied at the V7-V8 time-frame. The company does not recommend more than 1 qt of Plen-T-Sweet/acre for all future applications. In 2014, 10 oz of liquid brown sugar was applied in 10 gallons of water during V7. Three of the four years resulted in no statistically significant yield increase with the sugar application. In 2013, the check treatment yielded significantly higher than the Plen-T-Sweet treatment. It is thought the high rate of sugar coupled with gravity irrigation problems of getting water through the rows in a portion of the field which had the sugar-treated plots contributed to the yield differences. Soil tests taken for microbial activity (Phospholipid Fatty Acid-PLFA) in 2013 resulted in higher microbial activity in the sugar treated plots, but they were not statistically significant. An interesting trend is that the sugar treated plots consistently showed reduced stalk rot compared to the untreated check. Statistics were only conducted for stalk rot in 2014 in which the difference was not statistically significant.

2010-2011, 2013-2014 Sugar Applied to Corn Trials- Clay Co. Producer		
Producer	Avg Yield Check	Avg Yield Sugar
2010 Clay Co. (6 reps) 3 lb gran. Sugar/ac	208.9 (22% stalk rot)	210.6 ns (3% stalk rot)
2011 Clay Co. (6 reps) 3 lb gran. Sugar/ac	209.6 (19% stalk rot)	213.2 ns (12% stalk rot)
2013 Clay Co. (6 reps) 3 qts Plen-T-Sweet**/ac	222.6 (19% stalk rot)	214.2* (16% stalk rot)
2014 Clay Co. (6 reps) 13 oz liquid brown sugar/ac	226.2 (24% stalk rot)	228.6 ns (16% stalk rot) ns

*Indicates statistically significant at 95% confidence level. (2014 stats at 90% level).
 **Recommended rate is 1 qt of Plen-T-Sweet so the high rate coupled with irrigation problems may have affected study in 2013.
 3 lbs sugar (2010-2011), 3 qts Plen-T-Sweet (2013), 13 oz liquid brown sugar (2014) added to 10 gallons of water applied at V7-V8 leaf stage. Stalk rot ratings taken 2 weeks prior to harvest using the pinch test. Cost of sugar was \$1.25/acre in 2010-2011, \$6/ac in 2013 (should be \$2 with correct rate), and \$3.04/ac in 2014.

Results:

	Yield† (bu/acre)	Moisture (%)	Test Weight (lb/bu)	Harvest Pop	Stalk Rot (%)	Net Return ‡
Check	226 A*	14.5 A	63.0 A	28,600 A	24.2 A	\$791.00
Liquid brown sugar	229 A	14.6 A	63.2 A	29,200 A	16.0 A	\$791.65
<i>P-Value</i>	<i>0.5548</i>	<i>0.8420</i>	<i>0.7100</i>	<i>0.7607</i>	<i>0.2856</i>	--

†Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu, \$3.04/ac liquid brown sugar cost, \$6.81/ac application cost.

Summary: There was no significant yield, moisture, test weight, harvest population, or stalk rot difference between the check and the liquid brown sugar treatment.

Sugar on Corn: A Comparison to Fungicide

Study ID: 026185201403

County: York

Soil Type: Hastings silt loam

Planting Date: 4/23/2014

Harvest Date: 10/24/2014

Population: 34,000

Row Spacing: 30"

Hybrid: Pioneer 1105

Reps: 4

Previous Crop: Soybeans

Tillage: Ridge till

Herbicides:

Pre: 2.1 qt/ac Bicep II Magnum FC of Bicep II Magnum on 4/23/2014

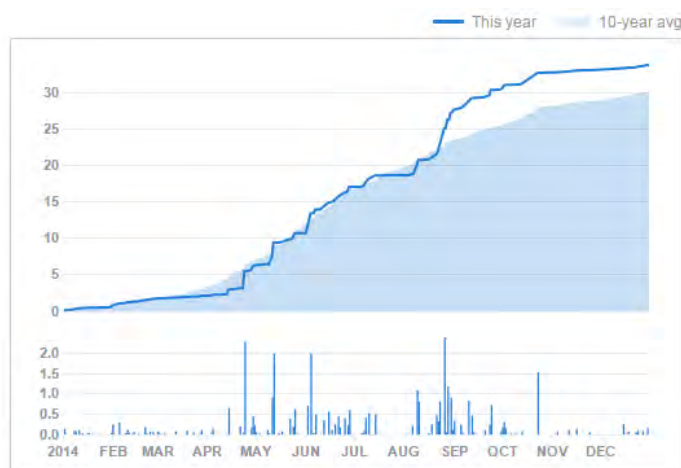
Post: 32 oz/ac Glyphosate on 6/10/2014

Fertilizers: 180# N/ac as Anhydrous ammonia in Fall, 3 gal/ac 10-34-0 at planting.

Note: Hailed on 6/4/2014

Irrigation: July: 3.5" Aug: 0.9" Total: 4.4"

Rainfall:



Introduction: This study is looking at the effects of fungicide or sugar applications on corn yields and profitability. This is the 3rd year these producers have conducted this study. In 2012 and 2013 the three treatments were check, sugar, and 2 oz/acre Stratego[®] YLD. In 2012 the sugar treatment was 3 lb/acre of granular sugar. In 2013 the sugar treatment was 3 qt/acre Plen-T-Sweet by Sure Crop[™] Liquid Fertilizers. In 2012 the crop was sprayed at V5-V6 and in 2013 the crop was sprayed at V7. 2012 results showed no difference in grain moisture or harvest population for any of the three treatments. Yield for the Stratego[®] YLD treatment was not significantly different than the check or sugar treatment. The sugar treatment was significantly higher yielding than the check treatment. In 2013 there was no difference among the three treatments in terms of moisture, harvest population or percent lodging. Yield for the sugar treatment was not significantly different than the check or Stratego[®] YLD treatment. The Stratego[®] YLD treatment was significantly higher yielding than the check.

The study was repeated in 2014 using granular sugar for the sugar treatment. The treatments were applied to corn on 6/20/14. The treatments were Stratego[®] YLD at 2 oz. acre and granular sugar at 3 lbs/acre. Corn was at approximately V7 growth stage at the time of foliar application.

Results:

	Yield [†] (bu/acre)	Moisture (%)	Pinch Test (%)	Harvest Pop	Net Return [‡]
Check	249 B*	17.8 A	3.3 A	27,000 A	\$871.50
Stratego[®] YLD at 2 oz/ac	254 A	17.8 A	2.5 A	29,000 A	\$875.94
Sugar - 3 lbs/ac granular	251 B	17.9 A	1.7 A	29,000 A	\$870.19
P-Value	0.0023	0.7345	0.5443	0.7809	--

[†]Bushels per acre corrected to 15.5% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

[‡]Net return based on \$3.50/bu, \$6.25/ac Stratego[®] YLD at 2oz/ac, \$0.50/lb Sugar, and \$6.81/ac application cost.

Summary: Stratego[®] YLD had a significantly higher yield than the check or the sugar. This increased yield resulted in higher net returns for the Stratego[®] YLD treatment. There was no significant difference between treatments for the pinch test.

Sugar on Soybeans

Study ID: 026185201404

County: York

Soil Type: Hastings silt loam

Planting Date: 5/3/2014

Harvest Date: 10/9/2014

Population: 145,000

Row Spacing: 30"

Hybrid: Pioneer 93Y15

Reps: 6

Previous Crop: Corn

Tillage: Ridge till

Herbicides:

Pre: 4 oz/ac Authority 1st at planting.

2/3 pt/ac 2,4-D, 22 oz/ac Roundup, and 1/3 oz/ac Aim on 4/9/2014.

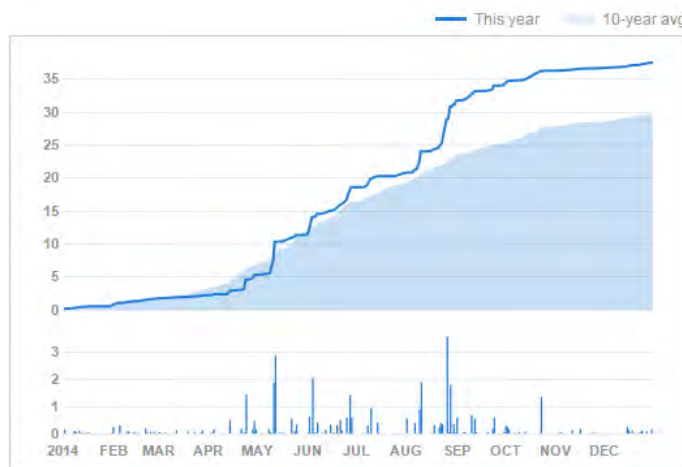
Post: 1 qt/ac and 5 oz/ac Roundup with Targa on 6/12 and 7/3/2014.

Insecticides/Fungicides: PPST 120 + Trilex + Allegiance

Note: Hailed 6/4, 7/7, and 7/31

Irrigation: July: 2.5" Aug: 2.25" Total: 4.75"

Rainfall:



Introduction: This is the second year these growers have completed this study. In 2013, 3 qts/acre of Plen-T-Sweet by Sure Crop™ Liquid Fertilizers was compared to no sugar application. The sugar was applied at the R3 growth stage on 7/22/13. Results showed there was no difference in the harvest population or moisture of grain at harvest. There was a 1 bu/acre yield increase (from 74.9 to 75.9 bu/acre) for the foliar sugar treatment which was significant at the 90% confidence level.

This year the study was continued to look at the effect of applications of foliar sugar on soybean profitability and yields. Three pounds of granular sugar were applied to the soybeans at R3 on 7/19/14.

Results:

	Yield [†] (bu/acre)	Moisture (%)	Net Return [‡]
Check	70 B*	10.2 A	\$700.00
Sugar	72 A	10.2 A	\$711.69
P-Value	0.0174	0.1747	--

[†]Bushels per acre corrected to 13.0% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

[‡]Net return based on \$10/bu, \$1.50/ac sugar, and \$6.81/ac application cost.

Summary: The sugar treatment had a significantly higher yield than the check. This added yield was able to cover the cost of the sugar and application costs.

Sugar on Sorghum

Study ID: 009129201401

County: Nuckolls

Soil Type: Hall silt loam

Planting Date: 5/17/2014

Harvest Date: 10/20/2014

Population: 65,000

Row Spacing: 30"

Hybrid: Pioneer 85Y40

Reps: 5

Previous Crop: Sorghum

Tillage: No-till

Herbicides:

Pre: Lumax EZ on 5/8/2014, and Lexar EZ on 5/21/14.

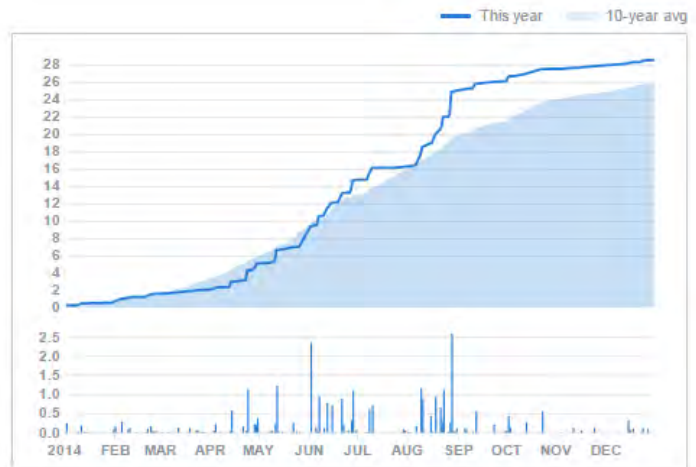
Post: 1 qt/ac Aatrex 4L and 13 oz/ac Huskie.

Insecticides/Fungicides: Poncho 600

Fertilizers: 110 lb/ac UAN 32% on 4/30/2014, and variable rate P, S, Zn on 4/27/2014.

Irrigation: Not irrigated.

Rainfall:



Introduction: This was the first year this producer applied sugar to sorghum. The objective was to determine the effect of sugar application on yield, economics, and lodging of sorghum. Rescue herbicide treatments in sorghum often lead to lodging making harvest more difficult. After seeing the corn stalk strength results, the producer wondered if adding sugar to sorghum would help with lodging after adding a post rescue treatment of Huskie + Aatrex to his field to control broadleaf escapes. Three pounds of granulated sugar per acre was added to 10 gallons of water and sprayed in a paired comparison design to sorghum at V7. The sprayer was then filled with Huskie +Aatrex and applied to the entire field which included the plot area. A northern portion of the plot which was more compacted and a lower area caused plant damage to the sorghum when the Huskie + Aatrex was applied (Figure 1). By harvest, the plants had tillered well (Figure 2), but the area was still squared off at harvest to avoid this affected area. The producer noticed plots without sugar had more lodging as he was harvesting.



Figure 1: Area of field affected by post treatment of herbicides.



Figure 2: By harvest, the plants had tillered well, but the area was still squared off to avoid damaged area.

Results:

	Yield† (bu/acre)	Moisture (%)	Stalk Rot (%)	Harvest Pop	Net Return ‡
Check	146 A*	14.4 A	4.0 A	59,500 A	\$511.00
Sugar	147 A	14.6 A	2.2 A	61,500 A	\$505.35
P-Value	<i>0.6775</i>	<i>0.2954</i>	<i>0.5078</i>	<i>0.2488</i>	--

†Bushels per acre corrected to X% moisture.

*Values with the same letter are not significantly different at a 90% confidence level.

‡Net return based on \$3.50/bu, \$0.78/lb sugar, \$6.81/ac application cost.

Summary: There were no statistical yield differences between the sugar and check treatments for yield, lodging, stand count or moisture.

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