Corn:Planter Fertilizer Rate Comparisons

- Should Phosphorus Fertilizer Be applied to Corn in High P Soils?(1996-2003)
- Proper Fertilizer Rate Selection for Corn (2000)
- Planter Rate and Nitrogen Rate Effect On Corn Yield (2002)
- Effect of Planter Fertilizer Rate and Components (2005)
- Manure Applications and Fertilizer Rates on Corn (2005)
- Comparison of Liquid N-P Starter Rates and Mixtures applied in the Furrow for Corn (Iowa-2003)
- Pro-Germinator Rate Response in Corn (2009)
- Planter Fertilizer Additives in Corn (2009)
- Planter Fertilizer Comparison in Corn (2009)

Experiment: Should Phosphorus Fertilizer Be Applied To Corn in High Phosphorus Soil? (North Central Research Station 1996 – 2003)

Often it is not recommended to apply phosphorus fertilizer when soil P levels are in the high range, such as over 20 ppm. An experiment was conducted over eight years where the soil P level is *over 50 ppm*. Some would think it a waste of money to apply phosphorus fertilizer under these conditions. Treatments compared were a planter fertilizer program of 5 gal/A Sure-K + 1 qt/A Micro 500 either alone or with 3 gal/A Pro-Germinator 9-24-3. Each treatment was replicated five times per year in 4-row by 100 foot plots. Yield results appear in the following table.

Effect of application of 9-24-3 with Sure-K in a high-phosphorus soil.
North Central Research Station 1996 - 2003.

	Yield - Bu/A. Average of 5 replications per year								
Planter application*	1996	1997	1998	1999	2000	2001	2002	2003	**Avg.**
3 gal/A 9-24-3 + 5 gal/A Sure-K	150.1	166.9	84.9	152.4	148.0	169.4	173.8	198.0	**155.4**
5 gal/A Sure-K	146.4	157.7	76.5	133.0	142.1	167.3	167.0	189.3	**147.4**

* - included 1 qt/A Micro 500.
Plots were side-dressed with 33 gal/A High NRG-N.

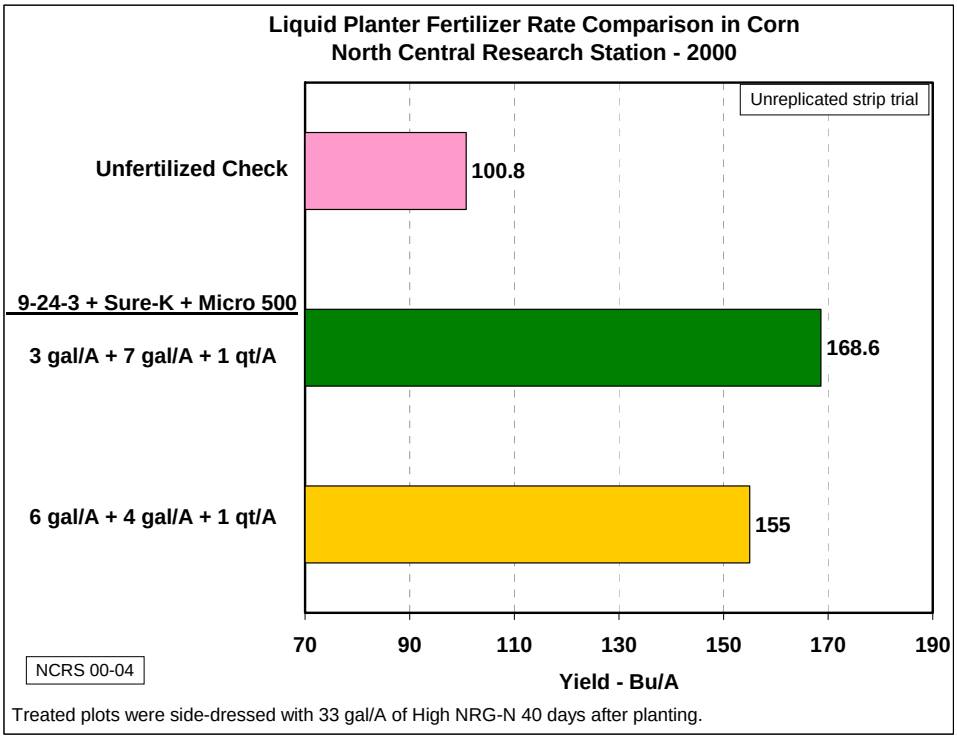
- In each year of the experiment, the application of Pro-Germinator 9-24-3 resulted in yield increase. Over the eight years of the experiment, application of the complete program averaged *8 Bu/A greater* than the treatment with Sure-K only. So enough of this nonsense about not using 9-24-3 in high-phosphorus soils.

Experiment: Proper Fertilizer Rate Selection for Corn
Year: 2000 (00-04)
Date of Planting/Harvest: April 28 / October 16
Plot Size: 4 row by 225 feet (side-by-side strip)

Soil Test Levels

pH: 6.5	OM: 2.5%
CEC: 12	P1: 51 ppm
K: 71 ppm	(1.5% base sat.)

Agro-Culture Liquid Fertilizers has always promoted application of correct rates of fertilizers for yield goal. It is difficult for some to accept that Agro-Culture Liquid Fertilizers alone can reach the yield goal. But variation in yield from variation in planter fertilizer rates does show the effectiveness of Agro-Culture Liquid Fertilizers. An experiment was conducted to evaluate two different rate combinations of Pro-Germinator 9-24-3 and Sure-K while keeping the total volume applied per acre the same. Based on a soil test for a yield goal of 150 Bu/A, a planter-applied rate of 3 gal/A of 9-24-3 + 7 gal/A of Sure-K + 1 qt/A of Micro 500 was determined, for a total application of 10.25 gal/A. A comparison rate of 6 gal/A 9-24-3 + 4 gal/A Sure-K + 1 qt/A Micro 500 was used. The comparison rate has more 9-24-3 than is recommended and less Sure-K, but the total volume is the same for both treatments. Yield results are in the following graph.



- The yield for the “correct” combination of 9-24-3 + Sure-K yielded higher than the “incorrect” combination rate, even though the total volume per acre was the same.
- This shows that fertilizer component rate, not just volume per acre rate, is an important factor in determining crop nutrient programs.

Experiment: Planter Rate and N Rate Effects on Corn Yield
Year: 2002 (02-04)
Date of Planting/Harvest: April 26 / October 23
Plot Size: 4 row x 130 feet (4 replications)

Soil Test Levels
pH: 7.0 CEC: 8.7 OM: 2%
P1: 61 ppm
K: 72 ppm (2.1% base sat.)

Objective: Determine rate effects of planter fertilizer and nitrogen fertilizer on corn yield.

This farm is under overhead sprinkler irrigation for the second year. Prior to irrigation, a base fertilizer rate for 150 Bu/A dryland corn was used. Now with irrigation, this rate has been adjusted for a yield goal of 200 Bu/A.

Dryland rate: Planter: 3 gal/A 9-24-3 + 7 gal/A Sure-K + 0.25 gal/A Micro 500;
Side-dress: 33 gal/A High NRG-N.
Irrigation rate: Planter: 5 gal/A 9-24-3 + 9 gal/A Sure-K + 0.375 gal/A Micro 500;
Side-dress: 43 gal/A High NRG-N.

Planter fertilizer placement was 1inch to the side of the seed. Both of these rates were applied to plots under overhead irrigation. Additionally, each planter rate was matched with the other program's High NRG-N rate. Thus, it could be determined which component had the greater impact on the expected higher yield under irrigation: increasing the planter rate or increasing the High NRG-N rate. This is the second year of this experiment. Yield results from both years are in the following table.

Fertilizer Rate Effects on Corn Yield
North Central Research Station, 2001 -02

9-24-3 + Sure-K + Micro 500;	High NRG-N (gal/A)	Yield - Bu/A 2001	2002	Avg.
3 + 7 + 0.25;	33	177.0	174.0	175.5
3 + 7 + 0.25;	43	181.6	195.1	188.4
5 + 9 + 0.375;	33	181.5	181.1	181.3
5 + 9 + 0.375;	43	194.2	195.8	195.0
	LSD (0.1)	14.4	9.4	8.5
	(0.2)	11.1	7.3	6.6

- It was interesting to see that the treatment yields were very similar in both years for 3 of the 4 treatments. There was a much greater response to the increased High NRG-N rate with the low rate of planter fertilizer in 2002 compared to 2001.
- In 2002, increasing the High NRG-N rate resulted in a greater yield response than increasing the planter fertilizer rate. (174 Bu/A to 195.1 Bu/A for nitrogen vs. 174 Bu/A to 181.1 Bu/A for planter fertilizer.)
- Averaged over both years, increasing *both* the planter fertilizer rate and the High NRG-N rate resulted in significantly higher yield than any of the other combinations.

Experiment: Effect of Planter Fertilizer Rate and Components
Year (Experiment Number): 2005 (05-05)
Date of Planting/Harvest: May 5 / Oct. 19
Hybrid: Pioneer 37R71
Plot Size (replications): 4 row x 100 ft. (5)

Soil Test Levels
pH: 6.3 C.E.C.: 7.2
OM: 1.8% P1: 52 ppm
K: 149 ppm (5.5% BS)

(Note: This was part of the long-term fertilizer experiment discussed above.)

Agro-Culture Liquid Fertilizers has the philosophy of applying only the nutrition that is needed for optimum plant growth. The objective of this experiment was:

1. Compare performance of the "correct" planter-applied rate selected based on soil test against both a lower rate and a higher rate.
2. Compare performance of the "correct" planter-applied rate against planter programs without the components Pro-Germinator 9-24-3 or Sure-K.

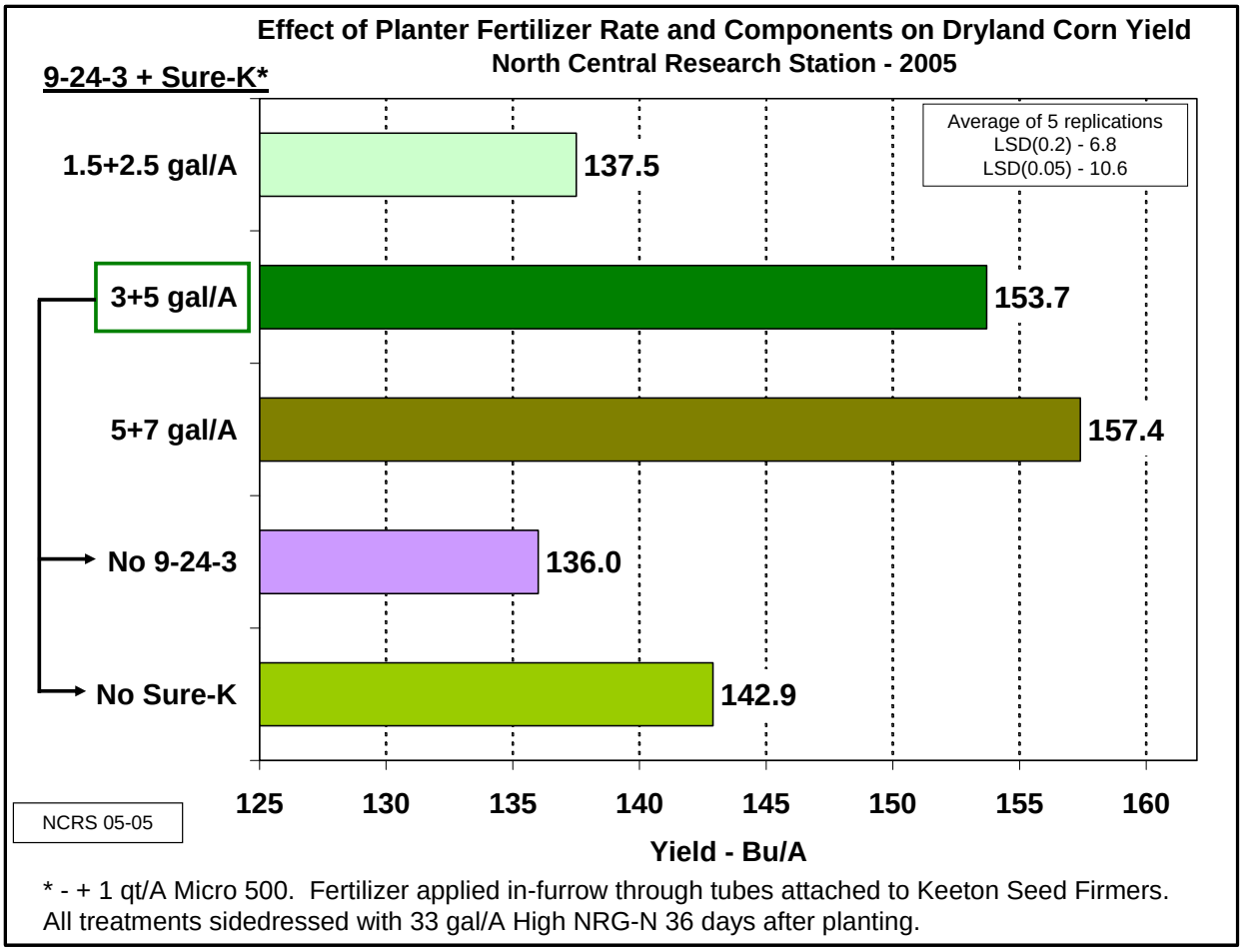
Using the correct rate
For years the standard planter-applied fertilizer rate used in this field has been:

3 gal/A 9-24-3 + 5 gal/A Sure-K + 1 qt/A Micro 500. This is followed by a sidedress application of 33 gal/A High NRG-N. In this experiment, two different planter-applied fertilizer rates were compared to the standard.

1. Half the standard rate (except for the Micro 500): 1.5 gal/A Pro-Germinator 9-24-3 + 2.5 gal/A Sure-K + 1 qt/A Micro 500.
2. An increase of 2 gal/A of each main component (except Micro 500): 5 gal/A Pro-Germinator 9-24-3 + 7 gal/A Sure-K + 1 qt/A Micro 500.

Using the correct fertilizer components
For this soil, a planter fertilizer should contain both Pro-Germinator 9-24-3 and Sure-K. Soil test does indicate high levels of phosphorus and potassium, so are both of these fertilizer components necessary? To find out, the standard planter-applied treatment of 3 gal/A Pro-Germinator 9-24-3 + 5 gal/A Sure-K + 1 qt/A Micro 500 was compared to treatments without either the Pro-Germinator 9-24-3 or Sure-K.

Yield results of these treatments appear in the following chart.



- Yield data indicate that the standard planter-applied rate (in the green square) is the optimum rate. Reducing the rate resulted in a significant yield reduction, while the higher rate had no significant effect.
- Elimination of either planter fertilizer component caused significant yield reduction, even though soil test levels for P and K were high.
- Elimination of the Pro-Germinator 9-24-3 had the greatest negative effect on yield. This shows the importance of usable phosphate in cold soils in early spring planted corn.

Experiment: Manure Applications and Fertilizer Rates on Corn (05-08)
Year: 2005 (05-08)
Date of Planting/Harvest: May 3 / October
Plot Size: 20' x 140'

Soil Test Levels
pH: 7.0 C.E.C.: 8.0
OM: 2.4% P1: 61 ppm
K: 120 ppm (3.8% BS)

Dairy manure applications have been made annually on one field at the North Central Research Station for the past eight years. One section of the field did not receive any manure where the other had a total of 40 ton/A of manure broadcast applied; 20 ton/A in the fall and 20 ton/A in the spring. The field was then moldboard plowed to incorporate the manure. Another section of the field has never received a manure application. In the fall of 2004 soil test were taken of each section to determine the nutrient levels after the long term manure applications. (See results on table 1). Using the soil test, fertilizer recommendations of Agro-Culture Liquid Fertilizers were established for each section of the field. As a comparison, the standard North Central Research Station program of 5 gal/A Pro-Germinator + 7 gal/A Sure-K + 1 qt/A Micro 500 (planting); 42 gal/A High NRG-N (sidedress) was applied to both sections of the field.
This plot has been continuous corn for 8 years and yields have always been on the high side. Because of the known yield potential and fact that it is irrigated a yield goal of 220 bu/A was set for this experiment. Higher yield goal called for higher fertilizer recommendations especially nitrogen.

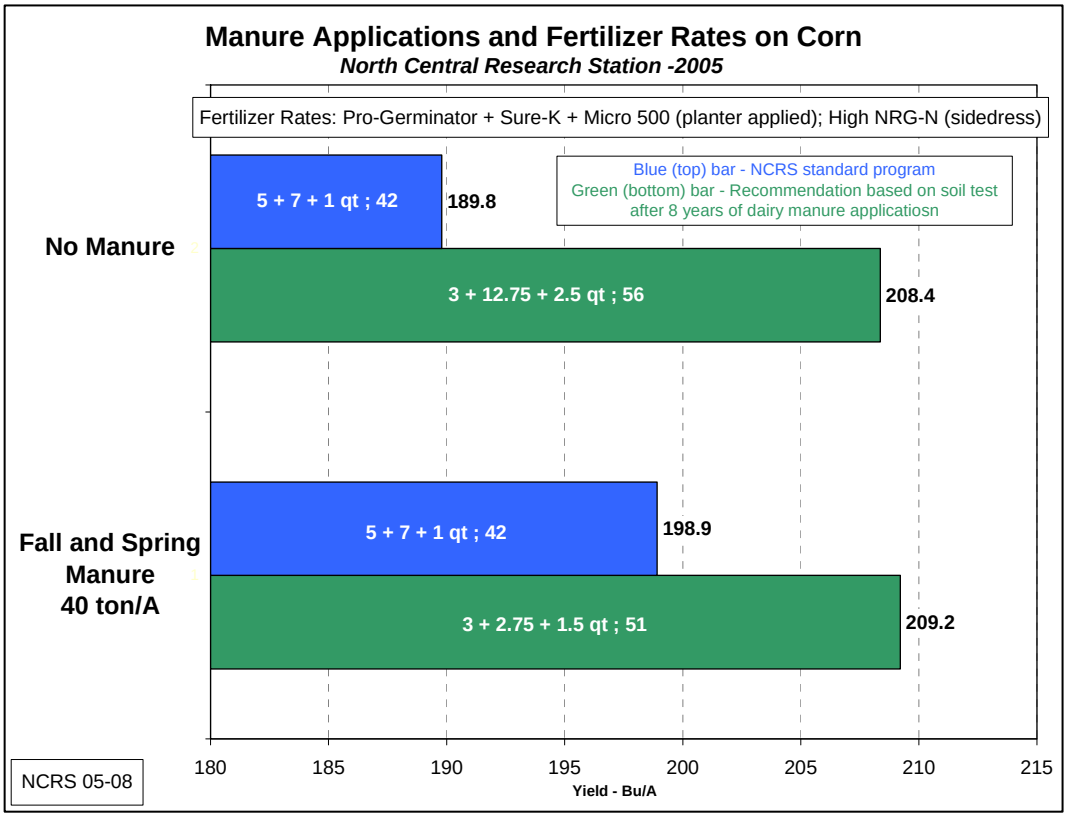
Table 1. Soil Analysis After 8 Years of Dairy Manure Applications
North Central Research Station - 2005

	Nitrate *lbs/A*	**P1** *ppm*	**K** *ppm*	**%K** *% base. Sat*	**Zinc** *ppm*	**Org. Matter** *%*	**CEC** *meq/100g*
No Manure	2	38	74	2.1	11	2.2	8.9
40 Ton/A Manure	25	68	250	8	14	2.3	8

Table 2. Agro-Culture Liquid Fertilzier Recommendations Based on Soil Analysis
North Central Research Station - 2005

	Pro-Germ. *gal/A*	**Sure-K** *gal/A*	**Micro 500** *gal/A*	**High NRG-N** *gal/A*
No Manure	3	12.75	2.5	56
40 Ton/A Manure	3	2.75	1.5	51

- As seen on most of the fields at the NCRS, phosphorus levels on both sections of the field were very high. Because of these high levels, the minimum recommendation of 3 gal/A Pro-Germinator was used.



- Potassium levels between the two sections of the field were significantly different. The 8 years of manure applications greatly increased the potassium levels and percent base saturation, therefore the Sure-K recommendation was reduced by 10 gal/A.
- Micro 500 recommendations were based off of the zinc levels. There was a slight increase in zinc with the manure applications, therefore reducing the Micro 500 recommendation.
- Unlike with the other nutrients, nitrate levels in the soil were very similar between the manure and unmanured sections of the field. With this slight difference there was only a 3 gal/A difference of High NRG-N rates between the manure applications.
- Similar yields were achieved by following the soil test recommendation from each section of the field. Therefore it can be concluded that no matter if you have manure or not, correct fertilizer recommendations will provide optimum yield.
- Following the standard North Central Research Station program did not provide enough of the essential nutrients to produce the highest possible yields.
- Addition of manure with the standard North Central Research Station program out yielded the no manure section by 10 bu/A.

Poster of 3-year field research project on phosphate fertilizers 9-24-3 and 10-34-0 in corn. By Dr. Antonio Mallorino and Manuel Bermudez. Iowa State University. Presented at the 2003 American Society of Agronomy Meeting. (Note: the fertilizers are reported in N-P-K rather than N-P_2O_5-K_2O units, so 9-24-3 is 9-11-2 and 10-34-0 is 10-15-0. But the dry comparison 11-52-0 is listed as 11-52-0.) For ease of reading, zoom in. Conclusion is listed below.

Comparison of Liquid N-P Starter Rates and Mixtures Applied in the Furrow for Corn: Grain Yield, Early Growth, and Early N-P Uptake

Manuel Bermudez and Antonio P. Mallarino
Iowa State University

Introduction

Cool and wet soils in spring can inhibit early plant growth, especially in soils managed with reduced tillage. Starter fertilizer placed in a band near the seeds can increase corn early growth and nutrient uptake. In some conditions these early plant responses could result in increased grain yield. Although most starter fertilizers include N, P, and K, increased growth responses usually are explained by the P in the mixture. The source of P varies among starter mixtures, and could have different effects on early plant growth or grain yield. The potential damage to seedlings due to high salt concentration varies across starter fertilizers, limiting the application rate that can be used for in-furrow fertilization.

The objective of this study was to evaluate P effects on corn early growth, nutrient uptake and grain yield using two liquid starter fertilizers applied in the seed furrow and a broadcast P rate commonly used by farmers.

Materials and Methods

• Strip trials were conducted in six Iowa cornfields that were managed with a corn-soybean rotation and chisel-plow tillage. Treatments were a no-P check, liquid starter 9-11-2 or 10-15-0 (N-P-K) at 6.6 or 19.4 kg P ha^{-1}, and broadcast P at 48 kg P ha^{-1}. The 9-11-2 fertilizer is marketed as a low-salt, Cl-free fertilizer with 30% orthophosphate and 70% long-chain phosphate polymer. The 10-15-0 fertilizer is a common ammonium-polyphosphate fluid fertilizer. Starter fertilizer was applied in the corn seed furrow. A rate of 112 kg K ha^{-1} was broadcast pre-plant and 120 kg N ha^{-1} was sidedressed (V5 stage) across all treatments. Strip width was 18 m and length was 200 m across fields. The treatments and four replications were arranged as a RCBD.

• Composite soil samples (12 cores, 15-cm depth) were collected from 250 m^2 areas located at the center of 0.5 ha cells. Soil was analyzed for P by the Mehlich-3 method, pH, and organic matter. Soil K was also tested, but data are not shown because a uniform K fertilizer rate was applied across all treatments. Iowa State University soil-test P interpretation classes were used in this study. The classes (g kg^{-1}) are 0-8 Very Low, 9-15 Low, 16-20 Optimum, 21-30 High, and >30 Very High.

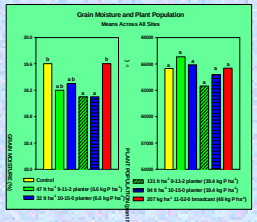
• The above-ground portions of 10 plants were collected from the center of each small cell defined by the treatment strips and soil sampling cells along crop rows at the V5-V6 growth stage. Plants were dried at 65°C, ground, and analyzed for total N and P concentrations.

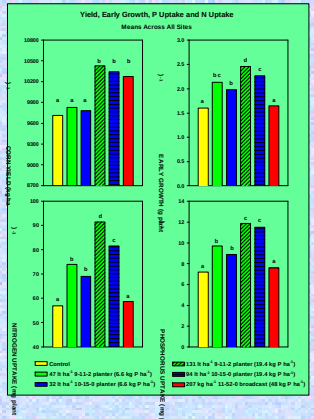
• Grain yield was harvested with combines equipped with yield monitors and global positioning system (GPS) receivers. Treatment effects on plant measurements were assessed by analysis of variance that accounted for spatial correlation with nearest neighbor analysis. In tables and figures, numbers followed by similar letters did not differ at P<0.05.

Site Characteristics

Site	Predominant Soil Series: Series	Classification†	Field Area	Descriptive Soil Test: P	OM	pH
			%	mg kg^{-1}	g kg^{-1}	
1	Canisteo	T. Haplaquoll	44	16	62	7.5
	Clarion	T. Hapludoll	34	13	45	7.9
2	Nicollet	A. Hapludoll	30	10	48	5.8
	Clarion	T. Hapludoll	28	10	46	7.9
3	Canisteo	T. Haplaquoll	49	15	33	7.4
	Nicollet	A. Hapludoll	41	13	31	7.5
4	Canisteo	T. Haplaquoll	59	17	40	7.6
	Clarion	T. Hapludoll	16	12	24	6.8
5	Clarion	T. Hapludoll	62	18	36	5.7
	Webster	T. Haplaquoll	38	21	43	5.9
6	Canisteo	T. Haplaquoll	45	17	63	7.1
	Clarion	T. Hapludoll	27	14	46	6.3

† A= Aquic, T= Typic.





Treatments and Grain Yield

Site	Control	Low rate 9-11-2	Low rate 10-15-0	High rate 9-11-2	High rate 10-15-0	Broadcast P	Response to fertilization
	Mg ha^{-1}						P <0.05
1	9.44a	9.73ab	9.63ab	10.04b	9.92b	9.61ab	0.05
2	9.31a	10.01b	9.99b	10.25b	10.34b	10.45b	0.01
3	9.66a	10.47b	9.77a	10.89bc	11.02c	11.35c	0.01
4	6.83	6.68	6.53	7.39	7.52	6.70	ns
5	11.49a	11.53a	11.76ab	12.40c	11.86ab	12.09bc	0.02
6	10.85	10.78	11.14	11.63	11.32	11.28	ns

Treatments and Early Dry Weight

Site	Control	Low rate 9-11-2	Low rate 10-15-0	High rate 9-11-2	High rate 10-15-0	Broadcast P	Response to fertilization
	g plant^{-1}						P <0.05
1	0.61a	1.02cd	0.90b	1.07d	0.96bc	0.60a	0.01
2	0.62a	0.94b	0.84b	0.95b	0.88b	0.69a	0.01
3	2.35a	3.38c	2.99bc	4.08d	3.79cd	2.70ab	0.01
4	1.94a	2.55bc	2.41b	2.72bc	2.81c	2.02a	0.01
5	2.12	2.38	2.35	2.96	2.49	1.70	ns
6	1.54a	1.90ab	1.88ab	2.23b	2.05b	1.61a	0.05

Treatments and Phosphorus Uptake

Site	Control	Low rate 9-11-2	Low rate 10-15-0	High rate 9-11-2	High rate 10-15-0	Broadcast P	Response to fertilization
	mg P plant^{-1}						P <0.05
1	2.9a	5.6bc	4.8b	6.4c	5.8c	2.8a	0.01
2	3.3a	5.2cd	4.4cb	5.6d	4.7cd	3.6ab	0.04
3	11.3a	15.5b	14.0ab	19.8c	18.6c	13.4ab	0.01
4	12.2a	15.0ab	13.9ab	16.0bc	18.4c	12.0a	0.01
5	6.2ab	7.2a	7.0a	10.6c	9.1c	5.0b	0.05
6	5.6a	7.1a	7.5ab	9.9c	9.3bc	6.5a	0.02

Treatments and Nitrogen Uptake

Site	Control	Low rate 9-11-2	Low rate 10-15-0	High rate 9-11-2	High rate 10-15-0	Broadcast P	Response to fertilization
	mg N plant^{-1}						P <0.05
1	24.9a	45.5c	40.2b	52.1d	46.1c	24.8a	0.01
2	25.7a	39.9cd	34.0b	44.1d	35.8bc	27.4a	0.02
3	86.1a	115.7b	102.1ab	142.6c	132.2bc	95.7ab	0.01
4	67.8a	86.5bc	83.4b	99.0c	99.4c	72.5ab	0.01
5	62.0	70.5	70.9	101.0	77.9	49.7	ns
6	59.5a	69.8ab	70.0ab	87.9c	78.3bc	62.7a	0.05

Results and Discussion

• Fertilization increased yield significantly at four sites. Mean soil-test P was Optimum or lower in responsive and non-responsive sites. The fertilizer treatments did not differ at Site 2, and treatment differences were inconsistent across other sites. The high starter fertilizer rates and the broadcast fertilization treatment usually produced higher yield than the lower rates.

• The starter products differed only in Sites 3 and 5. The low rate of 9-11-2 produced higher yield than the low rate of 10-15-0 at Site 3. The high rate of 9-11-2 produced higher yield than the high rate of 10-15-0 at Site 5.

• Fertilization increased early corn growth at five sites. In all sites the starter treatments increased early growth more than the broadcast treatment. The high starter rates usually produced more early corn growth than any other treatment. At the same P rate, the 9-11-2 fertilizer produced more early growth than the 10-15-0 fertilizer at three sites.

• Fertilization increased P uptake at six sites and N uptake at five sites. The starters greatly increased N and P uptake over the check and broadcast treatments, which coincided with responses in early growth. There was no difference in P uptake between starter fertilizers but 9-11-2 increased N uptake more than 10-15-0 at three sites.

• Across all sites, the high rate of 9-11-2 produced more early growth and N uptake than the 10-15-0 fertilizer.

• The advantage of the 9-11-2 fertilizer at two sites cannot be fully explained. The P source in this fertilizer could have been more efficient. However, a small amount of K and a higher N/P ratio could also explain results even though uniform rates of N and K fertilizers were applied across all treatments.

• High starter rates applied in the furrow did not reduce corn stand although such high rates seldom are recommended for in-furrow fertilization.

• High starter rates produced drier corn grain than the broadcast and control treatment.

• Study of grain yield, early growth and N-P uptake responses for the two predominant soil series showed no differences between soils at any site.

Conclusions

• Grain yield produced with the high starter fertilizer rates and broadcast fertilization did not differ. However, starter fertilization produced larger early growth and nutrient uptake while applying about one-half the P applied by the broadcast treatment.

• The 9-11-2 fertilizer produced higher yield, early growth, and nutrient uptake than 10-15-0 fertilizer at approximately one-half of the responsive sites.

Conclusions

• Grain yield produced with the high starter fertilizer rates and broadcast fertilization did not differ. However, starter fertilization produced larger early growth and nutrient uptake while applying about one-half the P applied by the broadcast treatment.

• The 9-11-2 fertilizer produced higher yield, early growth, and nutrient uptake than 10-15-0 fertilizer at approximately one-half of the responsive sites.

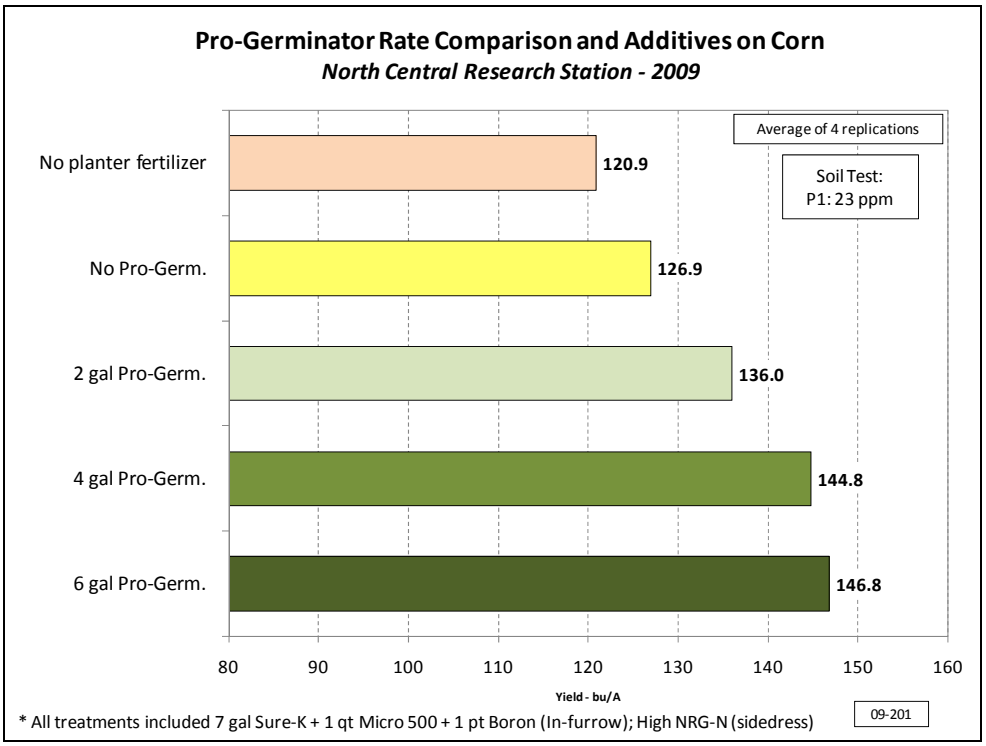
Experiment: Pro-Germinator Rate Response in Corn (09-201)

Planted:	5/4/09	**Hybrid:**	DKC52-59	**Population:**	33,000
Plot Size:	15' x 130'	**Replications:**	4	**Harvested:**	11/16/09
Sidedress:	6/2/09				

Soil Test Values *(ppm)*:

pH	CEC	% OM	P1	K	S	% K	% Mg	% Ca	% H	% Na	Zn	Mn	B
6.8	5.9	1.5	23	62	7	2.7	20.9	75.7	0	0.7	0.9	9	0.5

Objectives: To determine the ideal rate of *Pro-Germinator* applied to corn at planting in high phosphorus soils.



Yield increase over no Pro-Germ. per gallon of Pro-Germ.

Yield increase	gal Pro-Germ.	Yield/gal Pro-Germ.
9.1	2	4.6
17.9	4	4.5
19.9	6	3.3

Conclusions:

- Soil conditions resulted in poor growth of the corn, resulting in yields below the yield goal. Corn stature was reduced, but fertilizer responses were still observed.
- Even with the high soil phosphorus levels, all rates of *Pro-Germinator* increased yield over the no planter fertilizer treatment. This is consistent with previous results.
- The addition of *Sure-K* and micronutrients increased corn yield by 6 bu/A in the no *Pro-Germinator* treatment.
- Adding 2 gal of *Pro-Germinator* to planter fertilizer program increased yield by an additional 9 bu/A with a total 15 bu/A yield increase over the no planter fertilizer program.
- Increasing the *Pro-Germinator* rate to 4 gal/A increased yield by nearly 18 bu/A over the no *Pro-Germinator* treatment.
- No further yield increase was seen by increasing the *Pro-Germinator* rate to 6 gal/A.
- The yield response per gallon of *Pro-Germinator* applied shows the greatest return with the 2 gal rate.

*See *Product Descriptions* in the introduction for more information on ACLF products used.

SMZ101210NRG

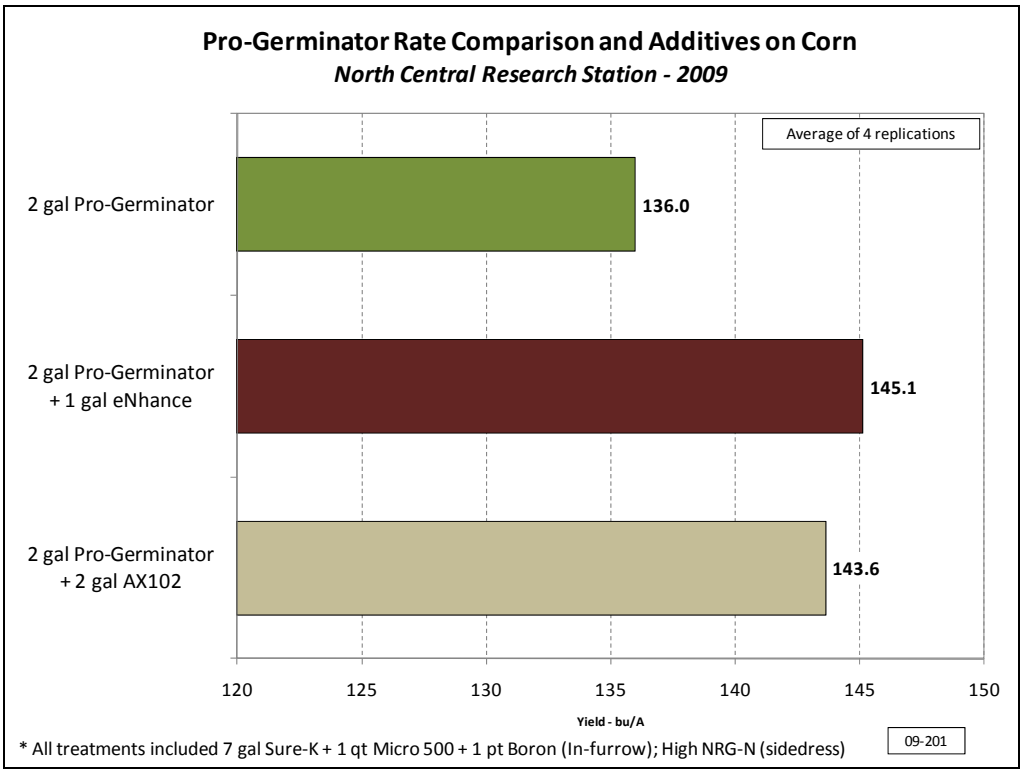
Experiment: Planter Fertilizer Additives in Corn (09-201)

Planted:	5/4/09	**Hybrid:**	DKC52-59	**Population:**	33,000
Plot Size:	15' x 130'	**Replications:**	4	**Harvested:**	11/16/09
Sidedress:	6/2/09				

Soil Test Values *(ppm)*:

pH	CEC	% OM	P1	K	S	% K	% Mg	% Ca	% H	% Na	Zn	Mn	B
6.8	5.9	1.5	23	62	7	2.7	20.9	75.7	0	0.7	0.9	9	0.5

Objectives: Evaluation of fertilizer additives to a corn planter program.



Additive Description:

eNhance was developed as a nutrient enhancement product to increase the usability of UAN solutions. With 8.7% sulfur plus manganese and zinc, this product is also being tested as a planter application where sulfur is needed.

AX102 is an experimental product high in carbon and also contains N, P, and K.

Conclusions:

- The addition of 1 gal/A of *eNhance* to the planter program increased corn yield over 9 bu/A in this low sulfur soil.
- This is the first year for testing *eNhance* as a planter fertilizer. With the 8.7% sulfur content, this product shows promise in areas where the sulfur levels of soil are low. More testing will be done.
- The additive *AX102* increased corn yield by nearly 8 bu/A.

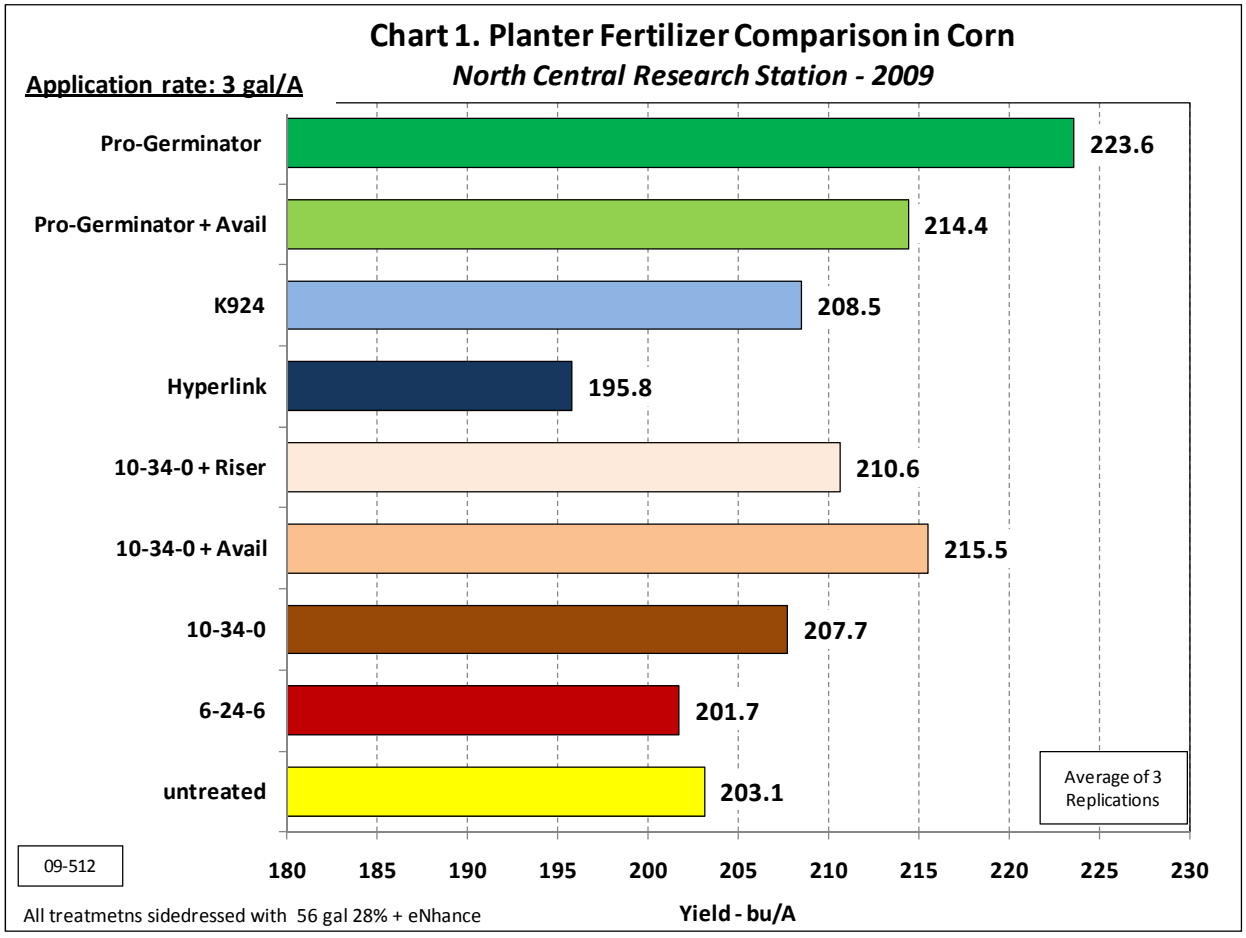
*See *Product Descriptions* in the introduction for more information on ACLF products used.

Experiment: Planter Fertilizer Comparison in Corn (09-512)

Planted:	5/8/109	**Hybrid:**	DKC52-59	**Population:**	36,000
Plot Size:	15' x 100'	**Replications:**	3	**Harvested:**	11/5/09
Sidedress:	6/5/09				

Soil Test Values *(ppm)*:													
pH	**CEC**	**% OM**	**Bicarb**	**K**	**S**	**% K**	**% Mg**	**% Ca**	**% H**	**% Na**	**Zn**	**Mn**	**B**
7.1	8.4	1.8	16	71	11	2.2	21.3	74.6	0	1.3	0.9	6	0.6

Objectives: Compare a number of different liquid planter-applied fertilizers for effects on corn yield. This soil tested relatively high in soil phosphorus, and the recommendation was for only 14 lb/A of phosphate for 200 Bu/A. As such, all products were applied at the same rate of 3 gal/A. Application was in-furrow with seed firmers.



Results:

LSD(0.05): 9.7, (0.2): 6. CV: 5.03%

Conclusions:

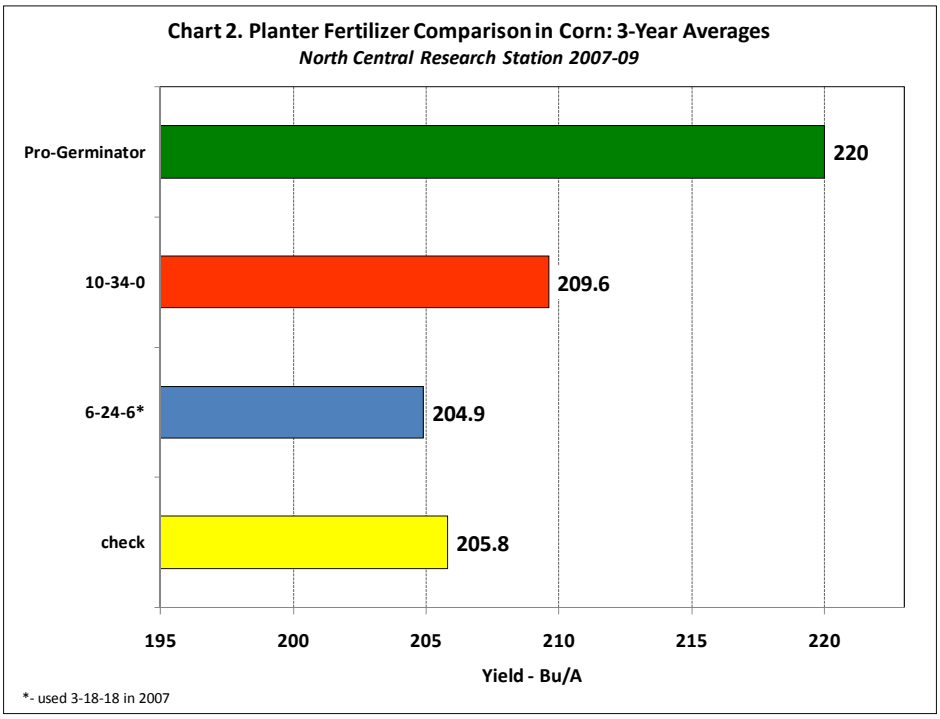
- Application of Pro-Germinator produced the highest yield by a significant margin over the other fertilizers. It is not clear why the addition of Avail resulted in a reduced yield. But the flavonol encapsulation of Pro-Germinator precludes the need for additional protection from tie-up, as Avail promotes. So there may have been some sort of interaction.
- Addition of Avail did increase yield produced with 10-34-0.

*See *Product Descriptions* in the introduction for more information on ACLF products used.

JLW015210NRG

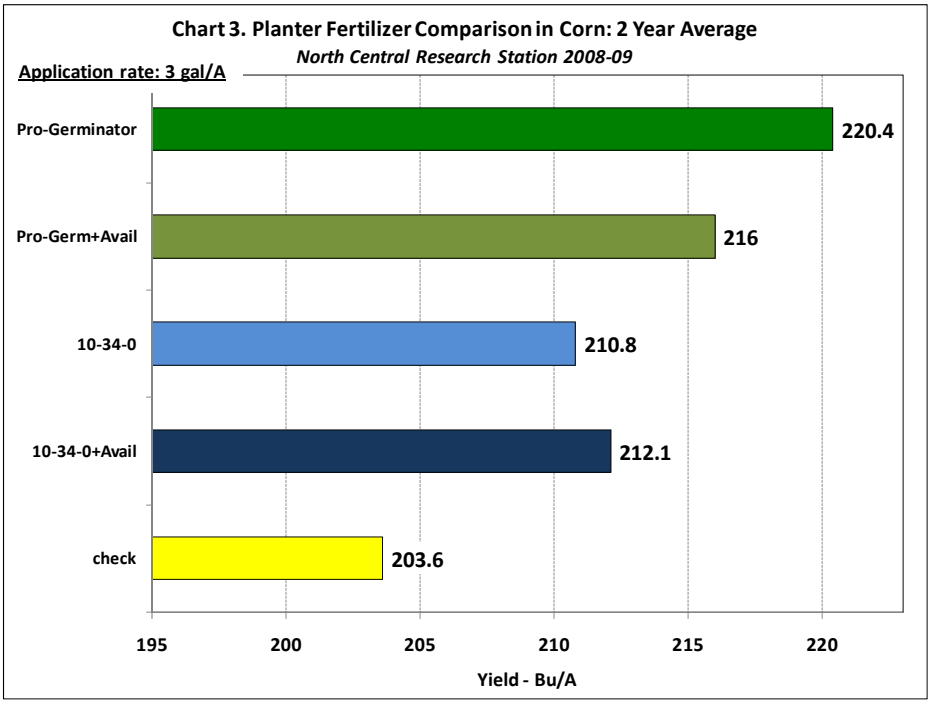
- K924, which has an analysis of 9-24-3, the same as Pro-Germinator, did have a yield significantly lower than that of Pro-Germinator, indicating that just because the analysis is the same, performance is not.
- The 10-34-0, Hyperlink (analysis 8-25-3) and 6-24-6 (100% ortho-phosphate) did not produce yields that were significantly different from the untreated corn.

Some of these treatments have been applied for a number of years, and results are shown in Chart 2.



- The Pro-Germinator consistently produced higher corn yield than either the poly- or ortho phosphates.

Additionally, comparisons have been made the past two years of the Avail product for effect on corn yield.



- Avail did not help yield with Pro-Germinator, although there was some benefit with 10-34-0.

*See *Product Descriptions* in the introduction for more information on ACLF products used.

JLW015210NRG