Graves - Chapple Farm

2005 Annual Report

Northwest Missouri Demonstration Site

http://extension.missouri.edu/atchison/Graves/Main%20page.htm

UNIVERSITY OF MISSOURI Extension

Commercial Agriculture PROGRAM

Agricultural Experiment Station
University of Missouri-Columbia College of Agriculture, Food and Natural Resources

The Graves - Chapple Farm is a research and demonstration site located in southwest Atchison County. Graves - Chapple East is located on the east side of I-29 at the foot of the bluffs. Graves - Chapple West is on the west side of I-29 adjacent to State Hwy 111.

The site was established in 1988 as a collaborative effort between Atchison County Extension, Holt County Extension, University of Missouri Extension Commercial Agriculture Program, the University of Missouri's Agricultural Experiment Station, local agribusinesses and local producers. Primary funding is provided by University of Missouri Extension and the Agricultural Experiment Station.

Projects at this site are devoted to various agronomic practices, with a major emphasis on the production of corn and soybeans. Work with forages, other row crops and alternative crops is also conducted. This site is somewhat unique in the state due to the soil types and the predominance of no-till planting techniques. Soil conservation and water quality issues are also addressed. The farm strives to perfect practices that will maintain or increase the profitability for area crop producers.

Acknowledgements

The staff appreciates the time and effort of the advisory committee that guides the work at this site.

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We want to thank the following people who have helped in so many ways throughout the year. A special thanks go to CAFNR Deans Tom Payne and John Gardner, Commercial Agriculture Director Rex Ricketts, and Karma Metzgar, University of Missouri Extension Northwest Regional Director, for their continuing support of Graves - Chapple Farm.

Bob Chapple	Kerry Clark	Cindy Hance	Marilyn Graves
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Regional Extension Faculty :

Jim Crawford - Natural Resources Engineering Specialist
Shawn Deering - Livestock Specialist
Amie Schleicher - Livestock Specialist
Wayne Flanary - Agronomy Specialist
Bob Kelly - Ag Business Specialist
Tom Fowler - Horticulture Specialist

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Tillage Systems in Corn

Objective

The objective of this demonstration is to evaluate the effect of different tillage systems on corn yields and profitability of the enterprise. This is the 15th year for this demonstration.

Methods & Materials

The four most common tillage systems practiced in this region were used for this demonstration. The tillage systems used were:

Fall & Spring Disk
Spring Disk
Notill
Fall Chisel & Spring Disk

Each plot consisted of eight rows spaced 30 inches apart and 250 feet long. Yield results were taken from the center six rows of each plot. The plots were planted on April 25, 2005 with a population of 29,900 seeds/acre into a field that raised soybeans in 2004. Harvest was conducted on September 30, 2005.

Results

In 2005, the highest yielding system was the Spring Disk plots with a yield of 224.7 bu/acre. The lowest yielding system was the Fall & Spring Disk plot which yielded 211.9 bu/ac. The average for the four systems was 221.0 bu/ac with a standard deviation of 6.1 bu/ac. Yield results for all four tillage systems are shown in Table 1 and Figure 1.

Perhaps a more valid comparison can be made by looking at the 15-year results of the study as shown in Figure 2. This long term collection of data allows the weather variable to be minimized since we had greatly varying weather patterns during this time period. During this 15 year period, the No-till system averaged 153.3 bu/acre out-yielding the other tillage systems used. The Fall and Spring Disk treatment had the lowest average of 150.6 bu/acre.

Corn Tillage System	Harvest Moisture %	Yield at 15.5% Moisture bu/acre
Fall & Spring Disk	14.9	211.9
Spring Disk	14.9	224.7
No-till	15.2	223.7
Fall Chisel/Spring Disk	15.1	223.7
Trial Averages	**15.0**	**221.0**
Standard Deviation		**6.1**

Table 1 - 2005 Corn tillage systems yield results.

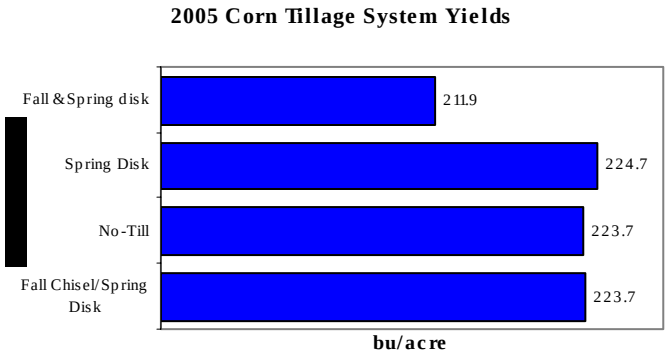


Fig 1 - 2005 Corn tillage systems yield results.

The most important aspect of the tillage trials is the net bottom line. The application of fertilizer, herbicides, seed, planting and harvesting were identical for each of the tillage

Corn Tillage System	15 Year Yield Ave bu/acre	Gross Income @ $2.00/bu	Tillage Costs per Acre	Gross Income less Tillage Costs per Acre
Fall & Spring Disk	150.6	$301.11	$16.64	$284.47
Spring Disk	150.7	$301.39	$8.32	$293.07
Notill	153.3	$306.63	$0.00	$306.63
Fall Chisel/Spring Disk	151.1	$302.24	$19.69	$282.55

Table 2. Gross income per acre minus tillage costs over a 15 year period.

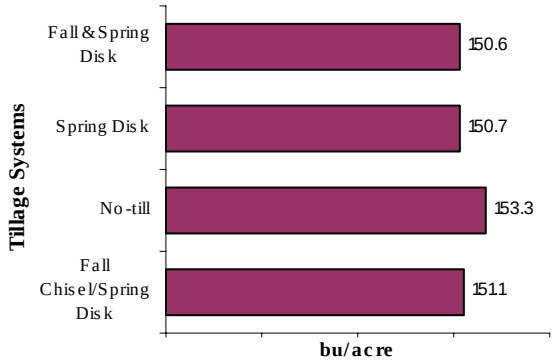


Fig 2 - Corn Tillage systems 15 year yield averages.

systems used. The economic differences shown are a result of the tillage procedures conducted on each plot and the associated costs.

It is very difficult to estimate tillage costs as each grower's operating costs will be different. Age and size of the equipment, field shape and size as well as soil type will all effect the tillage costs. A large variable this past season was fuel costs. We have tried to estimate an average cost but most will agree it is below average.

One factor not considered in the economic analysis is labor. It is almost impossible to place a value on a producer's labor per hour. Therefore, no labor costs are included in the analysis.

Table 2 provides a summary of the gross income per acre minus the costs for the tillage work that was conducted. If we use a value of $2.00 per bushel, over this 15 year period, the no-till plots grossed between $13.56 and $24.08 per acre more than the other tillage systems.

Another important factor that is sometimes not considered is the benefit to the environment of different tillage practices. No-till programs greatly reduce the amount of soil erosion caused by wind and water runoff. Soil particles are the number one contaminant found in the rivers and streams of Northwest Missouri. These particles not only cloud the water but they also may have other pollutants (herbicides, insecticides, fertilizer) adhered to them which may contaminate the water.

Tillage Systems in Soybeans

Objective

The objective of this demonstration is to evaluate the effect of different tillage systems on soybean yields and profitability This is the 5th year for this demonstration.

Methods & Materials

The four most common tillage systems practiced in this region are used for this demonstration. The tillage systems used are:

Fall Chisel & Spring Disk
No-till
Spring Disk
Fall & Spring Disk

Each plot consisted of eight rows spaced 30 inches apart and 250 feet long. Yield results were taken from the center six rows of each plot. The plots were planted on May 20, 2005 with a population of 188,500 seeds/acre into a field that was planted in corn in 2004. Harvest was conducted on October 27, 2005.

Results

In 2005, the highest yielding system was the No-till plots with a yield of 64.6 bu/ac. The lowest yielding system was the Fall and Spring Disk plot which yielded 50.9 bu/ac. The average for the four systems was 60.7 bu/ac with a standard deviation of 6.6 bu/ac. Yield results for all four tillage systems are shown in Table 1 and Figure 1.

If you compare the data obtained over the five years of the study, the No-till treatment has had the highest average yield for any of the tillage methods with an average of 53.8 bu/acre per year. The Fall and Spring Disk treatment had the lowest average yield for any of the treatments with an average of 51.1 bu/ac per year. These averages are shown in Figure 2.

Soybean Tillage System	Harvest Moisture (%)	Yield at 13.0% Moisture bu/acre
Fall Chisel/Spring Disk	12.1	64.5
No-till	12.1	64.6
Spring Disk	12.1	62.8
Fall & Spring Disk	12.1	50.9
Trial averages	**12.1**	**60.7**
Standard Deviation		**6.6**

Table 1 - Soybean tillage systems yield results.

With five years of data, you can see a trend developing in the yields for each tillage method. This longer term collection of data allows the weather variable to be minimized since we had varying weather patterns during this time period.

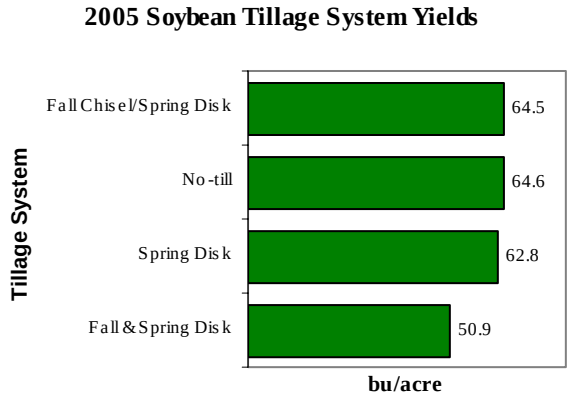


Fig 1 - 2005 Soybean tillage systems yield

Soybean Tillage System	5 Year Yield Ave bu/acre	Gross Income @ $5.50/bu	Tillage Costs per	Gross Income less Tillage
Fall Chisel/Spring disk	52.7	$289.93	$19.69	$270.24
No-till	53.8	$296.16	$0.00	$296.16
Spring Disk	52.4	$287.99	$8.32	$279.67
Fall & Spring disk	51.1	$281.12	$16.64	$264.48

Table 2 - Gross income per acre minus tillage costs over a five year period.

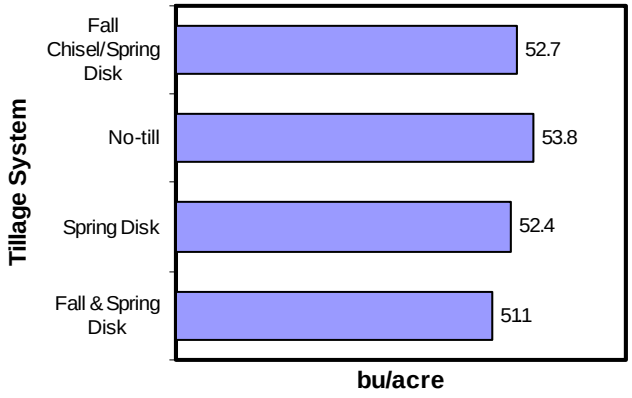


Figure 2 - Soybean tillage 5 year yield averages.

The economic analysis follows the trend we have seen in the corn tillage demonstrations. The application of the fertilizer, herbicides, seed, planting and harvesting were identical for each of the tillage methods used. The economic difference is a result of the tillage procedures conducted on each plot and the associated costs. It is very difficult to estimate tillage costs as producers's operating costs will be different. Age and size of the equipment, field shape and size, and soil type will all effect the tillage costs. A large variable this past season was fuel costs. We estimated an average cost but most will agree it is below average.

One factor not considered in the economic analysis is labor. It is almost impossible to place a value on a producer's labor per hour. Therefore, no labor costs are included in the analysis.

Table 2 provides a summary of the gross income per acre minus the costs for the tillage work that was conducted. For the five years of this study, the No-till plots grossed between $16.49 and $31.68 per acre more than the other tillage systems assuming a price of $5.50 per bushel for soybeans.

Another important factor that is sometimes not considered is the benefit to the environment of different tillage practices. No-till programs greatly reduce the amount of soil erosion caused by wind and water runoff. Soil particles are the number one contaminant found in the rivers and streams of Northwest Missouri. These particles not only cloud the water but they also may have other pollutants (herbicides, insecticides, fertilizer) adhered to them which may contaminate the water.

Effect of Dry Nitrogen Sources on No-till Corn Yield

Objective

The availability of ammonium nitrate is decreasing because of Homeland Security issues. Urea and ESN are dry fertilizer materials that may be substituted in place of ammonium nitrate. The demonstration tested these products at different application timings and at different application rates when applied to no-till corn.

Methods & Materials

Ammonium nitrate, Urea and ESN (a polymer coated urea manufactured by Agrium) was applied at three timings; a March, April and May application date and each at 5 different nitrogen application rates. The plots were established on a site where soybeans were grown last year.

Crop Management Info

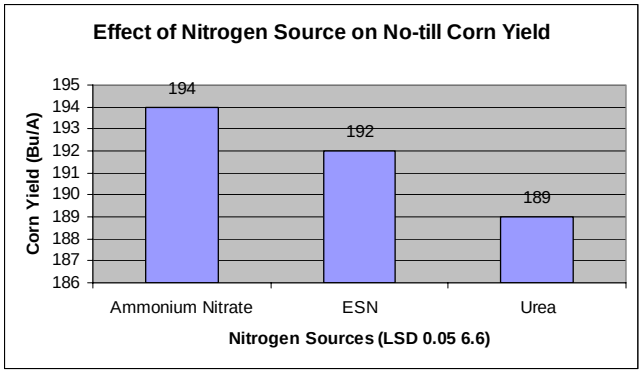
Planting Date : April 18, 2005
Herbicides: Dual + Atrazine
Hybrid: Pioneer 31P68
Insecticides: Lorsban
Population: 28,500 seeds/acre
Row Width: 30-inch

Demonstration Design

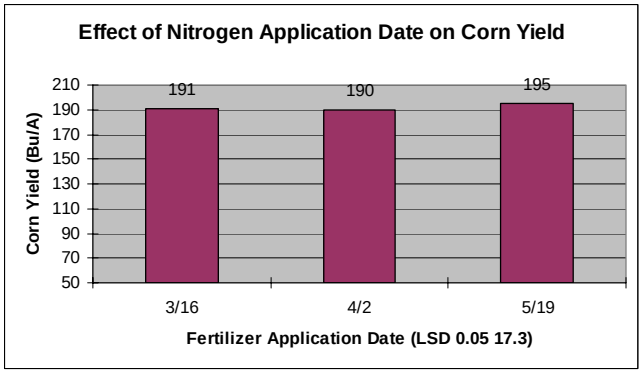
Replications: 3
Design: Split/Split Block
Size: 10' X 30'
Statistics: Analysis of Variance

Results

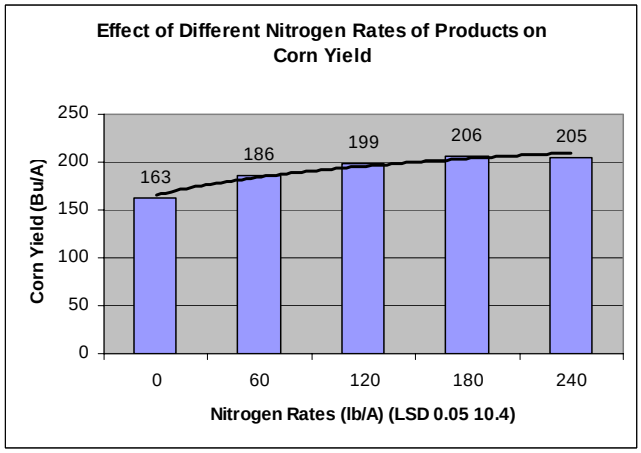
There was not a significant difference between the different nitrogen sources top-dressed. There was a trend for lower corn yields with urea but we did not see the large differences that are often discussed. Rainfall, as little as ¼-inch, following a urea application will incorporate the urea and the product will not be lost. The rainfall must be great enough to wash the product off the crop residue into the soil.



The efficiency of nitrogen fertilizer application timing is typically better when applied at the time the corn plant will utilize the nitrogen. Applications made early may have losses from different factors. The results indicate there was not a significant difference this year due to timing.



The combined corn yields from the nitrogen application rates show a response to increasing nitrogen rates. However, there was not a significant yield response to nitrogen beyond the 120 pound rate.



Objective

One of the unexpected results from the development of Roundup Ready® technology was the question of the best row spacing for soybeans. With Roundup®, it was thought that it did not matter how quickly your soybeans canopied since it was such an inexpensive chemical that killed all weeds by the roots and left the soybeans unharmed.

However, the dry conditions in Northwest Missouri the past few years has people talking about the subject again. Many of the 30, 36 and 38 inch row soybeans have not canopied. This has required a second, post-emergence application of chemicals to control weeds. Also, research conducted in other areas has shown a yield boost with 15-inch rows over other row spacings.

This study was designed to compare the yields as well as the economics of different row widths for Roundup Ready soybeans.

Methods & Materials

Three different row spacings were used as these represented how the majority of the soybeans are planted in this region. Planting populations were kept as close as possible using standard spacing adjustment equipment available from the manufacturers. No special equipment was used for this trial. The three treatments and their planting populations were:

30 inch planted - 172,000 seeds/acre
15 inch planted - 182,500 seeds/acre
8 inch drilled - 195,000 seeds/acre

The plots were 60 feet wide and 250 feet long. Roundup Ready soybeans were no-till planted into corn stubble on May 19, 2005. The plots were harvested on October 27, 2005 .

Results

All treatments emerged at approximately the same time with very little variation noted in the germination. All three plots were sprayed on June 15 with 1.5 pt/acre of Touchdown Total. The 30 inch row spacing beans required a second post emergence spraying on July 1 due to fairly heavy weed pressure.

Yield results for this demonstration are shown in Table 1. The average for all the treatments was 68.6 bu/acre with a standard deviation of only 2.5 bu/acre.

Treatment	Harvest Moisture %	Adjusted Yield Bu/acre
30" planted	12.7	67.5
15" planted	12.6	71.5
8" drilled	12.7	66.9

Table 1 - Soybean row spacing yield data.

A three year comparison of the yields for the three row spacings is shown in Figure 1. These averages show no significant yield differences between the treatments. The biggest advantage has been that in 2 out of 3 years, the 30 inch rows required two post emergence herbicide applications.

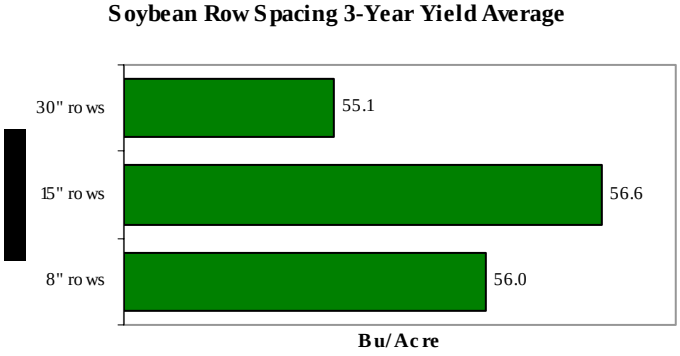


Figure 1 - Three year average for soybean row spacing yield data.

Double Crop Soybeans

Objective

Demonstrate a winter wheat/soybean double cropping system. Also, encourage winter wheat as a third crop which can spread weather, input and selling price risk.

Methods & Materials

Crop Management Info

Planting Date : Oct. 4, 2004 & July 5, 2005
Herbicides: Roundup
Hybrid: Truman Wheat
Wilcross 54315NRR soybeans
Insecticides: None
Population: 120 lbs/acre wheat
160,000 seeds/acre soybeans
Row Width: 9-inch wheat
30-inch soybeans

Demonstration Design

Replications: 3
Design: Randomized Block
Size: 10' X 30'
Statistics: Analysis of Variance

Results

The Truman winter wheat yielded 68 bu/acre. The soybeans yielded 21 bu/acre. The soil is a heavy gumbo soil at this location.

Recommendations for double crop winter wheat/soybeans:

⇒ A good stand of winter wheat reduces weed competition and keeps weeds small as the wheat matures. After wheat maturity, the weeds will be easier to control as they are smaller.

⇒ Weed competition may not only be from weeds but from wheat blown over during the harvest of wheat. If possible, delay the glyphosate application after the volunteer wheat has germinated and large enough to be controlled. Often, one herbicide application is all that is necessary for adequate soybean weed control.

⇒ Plant soybeans into moist soil. One may have to move surface soil in order to reach moist soil.

⇒ Use narrow rows rather than 30-inch rows when planting double crop soybeans. Research indicates a 15-20% increase in yield when moving to narrow compared to wide rows.

⇒ Increase seed rates of double cropped soybeans compared to normal planting rates.

⇒ Once soybean pods yellow, soybeans are close to maturity and yields from frost will be lessened

⇒ Fertilizer applications are developed from both crops rather than a single crop.

Objective

Demonstrate the value of CrusierMaxx seed treatment on stand and soybean yield.

Methods & Materials

Crop Management Info

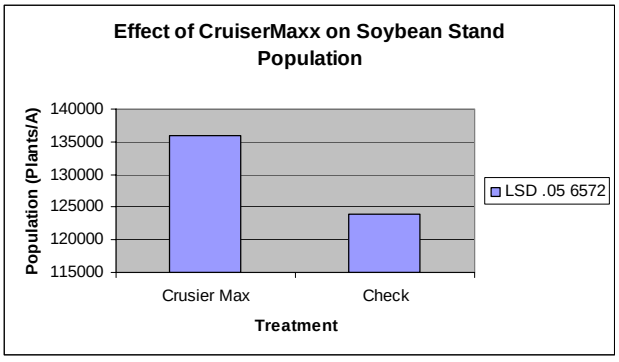
Planting Date : May 26, 2005
Herbicides: Roundup
Hybrid: Dekalb SD92955
Insecticides: CruiserMaxx seed treatment
Population: 162,000 seeds/acre
Row Width: 30-inch

Demonstration Design

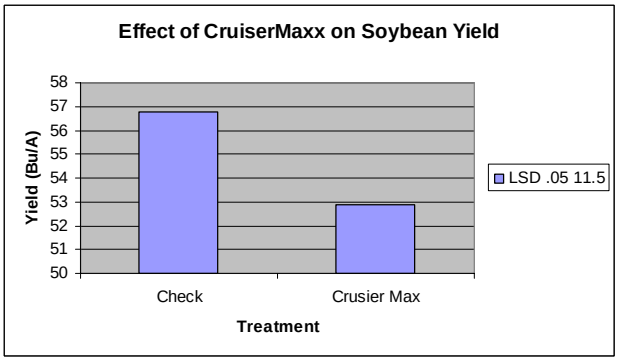
Replications: 3
Design: Randomized Block
Size: 10' X 30'
Statistics: Analysis of Variance

Results

There was a significant increase in soybean stand with treated seed.



However, the results did not translate into a significant yield response from the seed treatment. There was a lot of plot to plot variability with a LSD of 11.5.



Wireless Deer Fence

Objective

Due to the proximity to the bluffs, there is intense deer pressure on studies conducted on the farm. Several methods have been used to try to discourage their feeding on the studies without success.

An electric fence does not deter deer by being a barrier. It works by administering a harmless shock to the animal that teaches it to avoid the area. Bait, in the form of scent caps attached to the hot wires, is used to attract the deer where they will receive a shock. They remember this experience and avoid the area in which they received the shock.

Methods & Materials

The Wireless Deer Fence uses the same principle as a conventional electric fence but without the wire. Each post is approximately 19 inches tall and uses two, AA batteries to provide the shock. A capacitor stores the charge from the batteries until it is discharged. The posts are green, blending into the landscape and creating a very low visual impact. A scent tube is placed on top of each post between 4 bare wire electrodes. An attracted deer will sniff the scent tubes completing the circuit between the electrodes. The posts discharge and the electrical shock will deter their entry into the area. The effect is the same as a standard, high tensile electric fence without the posts, wire, chargers, etc. as well as being much more aesthetically pleasing.

The instructions accompanying the posts state they should be placed wherever deer are present; not just around the perimeter but also in the middle of the areas where they feed and on paths and frequently traveled areas. The posts in the middle of the plots allow the deer who bypass the perimeter to find a post as they browse for food. The instructions suggest, as a general rule, that posts be placed 5-25 feet apart.

After planting, the posts were installed every 20 feet (8 rows) on the edge of the plots and randomly throughout the center of the plots. Their low height allowed herbicides to be sprayed on the crops without moving the posts.

When deer feeding was noticed in certain areas, the perimeter posts were moved closer together and more posts were added to the inside of the test area. Eventually, perimeter posts were spaced five feet apart (every other row). As the crops grew taller than the posts, they were repositioned to ensure they were not grounding out on the plant material. Once the soybeans canopied, the center posts were removed as they were embedded in the foliage. The posts were left in the midst of the corn as the plant material did not contact the electrodes. Scent tubes were changed every two weeks. When the scent tubes were changed, each unit was manually discharged to ensure it was working properly. All units discharged every time. All posts were removed before harvest.

Results

The deer avoided the plants immediately around the posts but would feed as close as 3 feet from them. On several occasions, deer were witnessed walking between posts or feeding within 3-4 feet of posts. This feeding continued over the entire season with no visible reduction in plot damage in the treated plots vs. previous years.

After using the product for one season we do not believe they will be effective at repelling deer from field crop situations. For horticulture crops, such as flowers, bushes and small trees, we believe these would work well as they can be placed close enough to the protected item to deter feeding. Small garden patches may also benefit from this product as they can be placed densely enough to curb feeding. Their small size makes them an aesthetic alternative to conventional fencing.

Objective

Demonstrate the effect of crop rotation on reducing soybean cyst nematode levels.

Methods & Materials

Twenty-nine plots were established and cyst nematode egg counts are sampled each spring. The samples are point samples permanently marked in the plots. A composite sample of 10 cores per point sample is taken. Egg counts are run at MU's Nematology lab.

Results

A lot of variability exists from year to year in egg count numbers as shown in the accompanying table. This can be due to sampling error, growing season, and other factors such as rotations. In the long-term, it should give us trends on how long it may take for numbers to decrease using different strategies.

Plot #	Spring 2004 Egg Count	2004 Crop	Spring 2005 Egg Count
1	11750	Corn	11275
2	8250	Soybean	2750
3	46250	Corn	9075
4	8450	Corn	6325
5	28275	Corn	6875
6	19875	Corn	21750
7	38250	Corn	28600
8	23250	Corn	32725
9	27950	Corn	32625
10	22875	Corn	22120
11	29575	Corn	12925
12	17250	Corn	12350
13	10500	Corn	7800
14	9350	Corn	5525
15	7500	Corn	6600
16	16225	Corn	12375
17	14950	Corn	17550
18	20250	Sunflower	6175
19	16125	Corn	11700
20	6000	Milo	18700
21	5850	Corn	4950
22	7800	Soybean	4125
23	10725	Corn	5850
24	8775	Soybean	3575
25	6500	Corn	13750
26	50325	Corn	15600
27	45375	Corn	28600
28	84750	Soybean	42250
29	47250	Corn	25025

Planting Populations in Corn

Objective

With the high cost of seed and the ever fluctuating market, producers are trying to reduce their inputs as much as possible to maximize their net profit. One such input that can be varied is the seed population at planting. This demonstration is designed to help producers make decisions on planting rates taking into account conditions in Northwest Missouri.

Methods & Materials

This demonstration consisted of plots 250-feet long and 30 feet wide. The seed was no-till planted on May 16, 2005 into soybean stubble and harvested on October 18. The six different planting populations used were:

Plot #1 - 24,200 seeds/acre
Plot #2 - 27,700 seeds/acre
Plot #3 - 32,000 seeds/acre
Plot #4 - 35,600 seeds/acre
Plot #5 - 41,200 seeds/acre
Plot #6 - 48,600 seeds/acre

Results

All of the corn emerged at approximately the same time regardless of planting population. Emergence varied from 95.0 % to 99.5% as summarized in Table 1.

Plot #	Planted Population (seeds/acre)	Stand (plants/acre)	Emergence (%)
1	24,200	23,000	95.0%
2	27,700	27,000	97.5%
3	32,000	31,000	96.9%
4	35,600	34,000	95.5%
5	41,200	41,000	99.5%
6	48,600	47,000	96.7%

Table 1 - 2005 Corn population demonstration emergence rates.

Yields ranged from 183.2 bu/acre to 202.8 bu/acre. The yield data is shown in Table 2. With an average of 197.5 bu/acre and a standard deviation of 7.3 bu/acre, there was a significant difference between the different populations.

Plot #	Planted Population (seeds/acre)	Moisture @ Harvest (%)	Adjusted Yield 15.5% moisture (bu/acre)
1	24,200	15.4	201.7
2	27,700	15.8	202.8
3	32,000	16.0	197.1
4	35,600	15.9	200.5
5	41,200	15.7	199.9
6	48,600	15.3	183.2

Table 2 - 2005 Corn population demonstration yield data.

Figure 1 shows the average yields for each planting population over the past three growing seasons. Previous research has suggested that planting approximately 30,000 seeds/acre would provide the best net return for seed planted. This demonstration has shown no significant yield increases beyond a planted population of 27,700 and supports the earlier research.

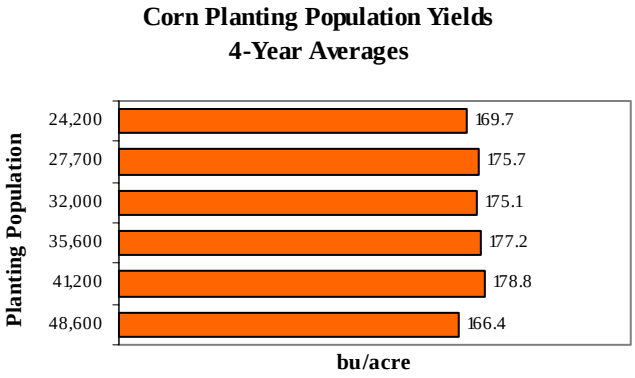


Figure 1 - Four-year yield averages for the corn population demonstration.

Objective

With the increasing cost of seed and the ever fluctuating market, producers are trying to reduce their inputs as much as possible to maximize their net profit. One such input that can be varied is the seed population at planting. This demonstration is designed to help producers make decisions on planting rates taking into account conditions in Northwest Missouri.

Methods & Materials

This demonstration consisted of plots 250-feet long and 12, 30-inch rows wide. The seed was no-till planted on May 17, 2005 into corn stubble and harvested on October 11, 2005. The six different planting populations used were:

Plot #1 - 243,000 seeds/acre
Plot #2 - 218,000 seeds/acre
Plot #3 - 189,000 seeds/acre
Plot #4 - 178,000 seeds/acre
Plot #5 - 151,000 seeds/acre
Plot #6 - 130,500 seeds/acre

Results

All of the soybeans emerged at approximately the same time regardless of the planted population. Emergence varied from 94.0% to 96.6% as summarized in Table 1.

Planted Population (seeds/acre)	Stand (plants/acre)	Emergence (%)
243,000	232,000	95.5%
218,000	205,000	94.0%
189,000	181,000	95.8%
178,000	171,000	96.1%
151,000	146,000	96.7%
130,500	126,000	96.6%

Table 1 - 2005 Soybean population demonstration emergence rates.

Yields ranged from 60.7 to 64.6 bu/acre. The yield data is shown in Table 2. With an average of 62.4 bu/acre and a standard deviation of 1.5 bu/acre, there was no significant difference between the different planted populations.

Planted Population (seeds/acre)	Moisture @ Harvest (%)	Adjusted Yield 13% moisture (bu/ac)
243,000	10.7	60.7
218,000	10.7	64.6
189,000	10.7	61.7
178,000	10.7	61.7
151,000	10.7	63.7
130,500	10.7	61.7

Table 2 - 2005 Soybean population demonstration yield data.

Figure 1 shows the average yields for each planting population over the past four growing seasons. Previous research had suggested that planting approximately 180,000 - 200,000 seeds/acre would provide the best net return for seed planted. This demonstration supported the past research.

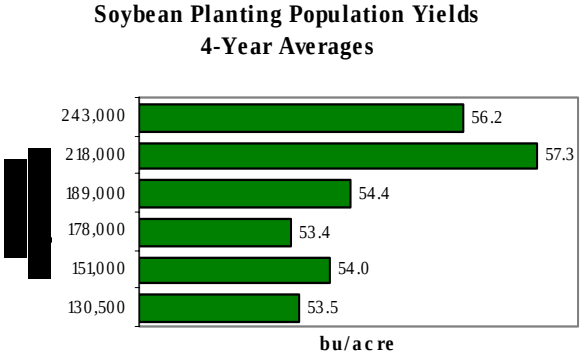


Figure 1 - Four year yield averages for the soybean population demonstration.

Effect of In-season Lime Applications on Corn Yield

Objective

Demonstrate the effect of different liming products top-dressed on no-till plots. Secondly, demonstrate different liming rates ranging from 0 to 6 ton lime top-dressed on no-till plots.

Methods & Materials

Lime materials were top-dressed to standing corn on June 2. The quarry lime contained 377 ENM per ton and the pelleted lime contained 580 lb ENM per ton.

The lime materials were applied late but this was necessary for the lime to activate for next year's soybean crop. The pH of the site ranges from 5.2 to 5.4.

Crop Management Info

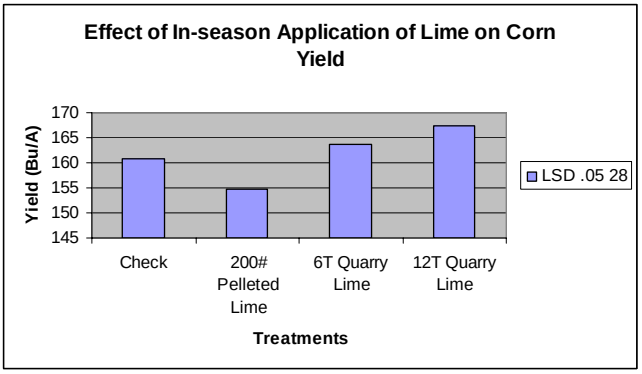
Planting Date : May 5, 2005
Herbicides: Dual + Atrazine
Hybrid: Golden Harvest H9359
Insecticides: Lorsban
Population: 28,500 seeds/acre
Row Width: 30-inch

Demonstration Design

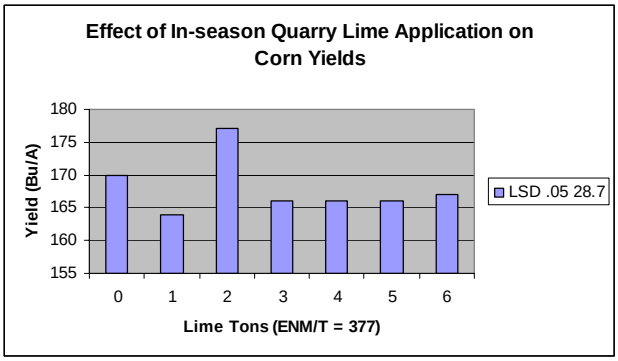
Replications: 3
Design: Randomized Block
Size: 10' X 30'
Statistics: Analysis of Variance

Results

Lime did not have time to activate this season. There was not a significant difference among products. Also, corn can tolerate a lower pH than soybean.



Also, there was not a significant difference between lime rates on corn yield.



Objective

Demonstrate the effect of sulfur fertilizer on corn yield.

Methods & Materials

The sulfur plots had a rate of 20 pounds actual sulfur applied in the form of ammonium sulfate. The nitrogen in the ammonium sulfate was credited and the rate of ammonium nitrate adjusted so the sulfur treated plots and check each received 200 pounds of nitrogen.

Crop Management Info

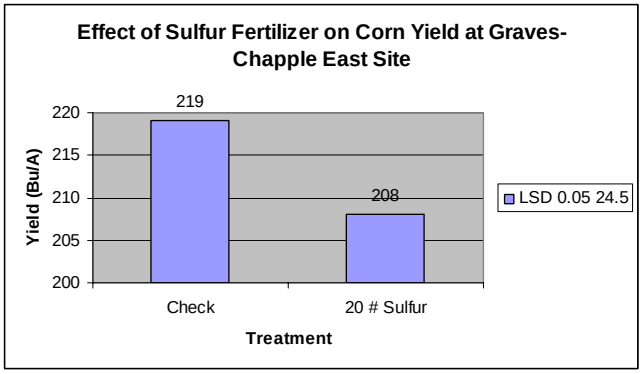
Planting Date : April 25, 2005
Herbicides: Dual + Atrazine
Hybrid: Pioneer 33P62
Insecticides: Lorsban
Population: 28,500 seeds/acre
Row Width: 30-inch

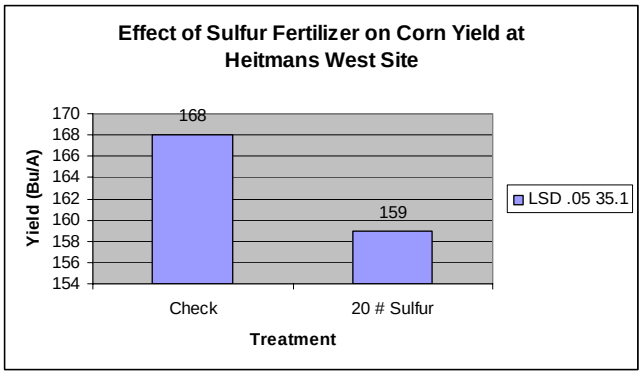
Demonstration Design

Replications: 6 East Site, 3 West Site
Design: Randomized Block
Size: 10' X 30'
Statistics: Analysis of Variance

Results

There was not any significant response to the addition of sulfur fertilizer at either site.





Forage Wheat or Triticale in a Double Crop System

By: Shawn Deering
Regional Livestock Specialist

Introduction

Wheat is typically thought of as a grain crop in Northwest Missouri, although producers in Kansas, Texas, and Oklahoma have relied on it for years as a winter pasture and also as a forage crop. Data published by Kansas State University trials several years ago indicated that wheat can be a high yielding silage and hay crop. It also has the potential to be used in a double crop system. Triticale is a wheat and rye cross. There is not much of a demand for the grain, but the forage yield tends to be higher than wheat although the quality is usually lower. It may be either hayed or grazed.

Many people are unaware that soybeans were first brought into the United States to be used as a forage crop. In 1924, over 1 million acres of soybeans were grown for hay in the U.S. The use of soybeans for hay continued well into the 20th Century. However, in the latter half of the 20th Century soybeans became popular as an oil seed crop and their use as a forage became a rarity. Selection was based on grain yield and the type of soybeans changed.

Recently, there has been renewed interest in using soybeans for forage. This is mainly due to the work of Tom Devine, USDA, Elwood Hatley, Penn State University, and David Starmer, VA Tech University. They developed and released three new forage type soybean varieties which are as follows:

Donegal – Group V recommended for the Northeast;
Derry – Group VI recommended for the Midwest;
Tyrone – Group VII recommended for the South;

University and on-farm demonstrations have reported dry matter yields as high as six tons per acre with 17 to 22% crude protein levels.

Materials & Methods

Cow Pro Forage Wheat and Triticale were provided by Missouri Southern Seeds. They were planted on October 20th, 2004 at a rate of 80 pounds per acre on eight inch row spacing. Two pts per acre of Touchdown were also applied at planting. Ninety pounds of nitrogen was applied on April 27th, 2005.

After harvesting the forage wheat and triticale plots, the area was divided in half and either Derry Forage Soybeans or NK S35 Roundup Ready Soybeans were planted on June 20th, 2005. Derry soybeans were planted at 2 bushels per acre and 2 handfuls of corn were also included to simulate cleaning out the corn planter. The corn was added simply to increase tonnage and yield. The Roundup Ready soybeans were planted at the rate of 182,700 seeds per acre. Both of the soybean plots were sprayed with Touchdown Total on the 20th.

Results

The plots were harvested on June 6th, 2005. The forage wheat yield was 14,157 pounds per acre wet (70% moisture), or 4.9 tons of dry matter per acre. The triticale yield was 18,208 pounds per acre wet (59% moisture), or 5.2 tons of dry matter per acre. Samples were put up as dry hay. Forage nutrient analyses were conducted on both samples. On a dry matter basis, the crude protein and TDN values were 9.7 and 47 for the triticale and 8.9 and 59

for the Forage Wheat, respectivley. The results are included in Figure 1.

Forage soybean yields were unable to be collected this year due to equipment failure. However, if we look at the published data from other university trials we know that yields of 6 tons of dry matter per acre on forage soybeans are very attainable. This would indicate that it is very possible to obtain 10 tons of dry matter yield per acre of very high quality forage using equipment that most farmers have anyway! It does seem though that the forage soybeans work best when using a bale wrapper of some type.

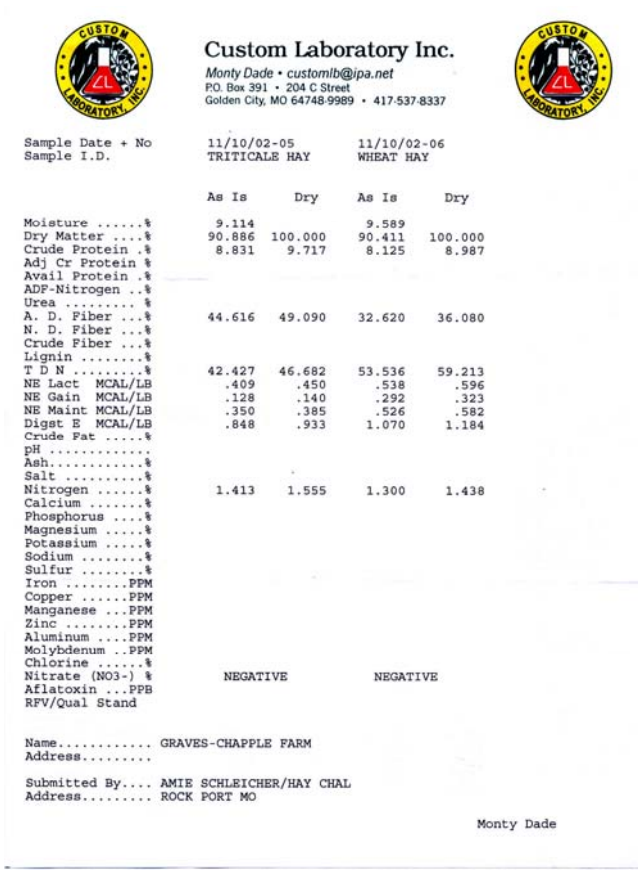
The part of the study that we are the most excited about is the one with the conventional soybeans. The conventional Roundup Ready soybeans yielded 35 bushels per acre following the forage wheat and triticale. This yield is a little deceptive as these plots had extreme pressure from deer that sought them out as they were planted later than other soybeans at the research station. Even so, we considered this plot a success in that we were able to demonstrate a 5 ton per acre yield of high quality forage followed by a cash crop of around $200.00 per acre taken off of the same piece of land! Think about this…getting the winter feed for your cowherd and a cash crop off the same acreage. We think that this has potential.

Discussion

Why are we interested in forage wheat and triticale used in a double crop system with either forage soybeans or conventional soybeans at Graves-Chapple?

You can take two high quality, high yielding hay crops off the same piece of ground. This could perhaps decrease the amount of grass hay acreage needed. With increasing land and rent prices, it may become more and more important to maximize the use of the land resource you have.

It can also work in a double crop situation with conventional soybeans. This allows you to take a hay crop and a cash crop off the same piece of ground. Again, you would be maximizing the use of your land resource.



Custom Laboratory Inc.

Monty Dade • customlb@ipa.net
P.O. Box 391 • 204 C Street
Golden City, MO 64748-9989 • 417-537-8337

Sample Date + No	11/10/02-05		11/10/02-06	
Sample I.D.	TRITICALE HAY		WHEAT HAY	
	As Is	Dry	As Is	Dry
Moisture .....%	9.114		9.589	
Dry Matter ....%	90.886	100.000	90.411	100.000
Crude Protein .%	8.831	9.717	8.125	8.987
Adj Cr Protein %				
Avail Protein .%				
ADF-Nitrogen ..%				
Urea ..... %				
A. D. Fiber ...%	44.616	49.090	32.620	36.080
N. D. Fiber ...%				
Crude Fiber ...%				
Lignin .....%				
T D N .....%	42.427	46.682	53.536	59.213
NE Lact MCAL/LB	.409	.450	.538	.596
NE Gain MCAL/LB	.128	.140	.292	.323
NE Maint MCAL/LB	.350	.385	.526	.582
Digst E MCAL/LB	.848	.933	1.070	1.184
Crude Fat .....%				
pH				
Ash.....%				
Salt .....%				
Nitrogen .....%	1.413	1.555	1.300	1.438
Calcium .....%				
Phosphorus ....%				
Magnesium .....%				
Potassium .....%				
Sodium .....%				
Sulfur .....%				
Iron .....PPM				
Copper .....PPM				
Manganese ...PPM				
Zinc .....PPM				
Aluminum ....PPM				
Molybdenum ..PPM				
Chlorine .....%				
Nitrate (NO3-) %	NEGATIVE		NEGATIVE	
Aflatoxin ...PPB				
RFV/Qual Stand				

Name..... GRAVES-CHAPPLE FARM
Address.....

Submitted By.... AMIE SCHLEICHER/HAY CHAL
Address..... ROCK PORT MO

Monty Dade

Figure 1 - Nutrient analyses for tritacale and forage wheat produced at the Graves-Chapple Farm in 2005.

Effect of Starter Fertilizer on Corn Yield

Objective

Demonstrate the effect applying starter fertilizer two inches to the side of the seed furrow. Research in Kansas and Illinois has shown significant yield response from starter fertilizers placed on top of the soil and two inches to the side of the seed furrow. This type of placement would be valuable with the number of no-till corn acres planted on highly erodible soils.

Methods & Materials

The different treatments were adjusted for the total nitrogen to be applied as 200 pounds. Phosphorus was also adjusted. Phosphate levels at this site are above P-1 test of 45 lb/A so the probability of a response from phosphorus would not be likely.

Crop Management Info

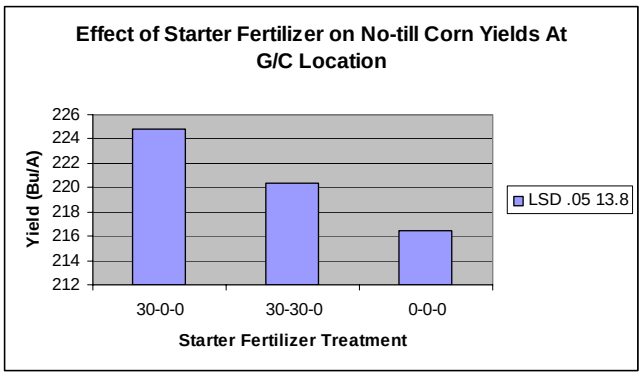
Planting Date : April 25, 2005
Herbicides: Dual + Atrazine
Hybrid: Pioneer 33P62
Insecticides: Lorsban
Population: Thinned to treatments
Row Width: 30-inch

Demonstration Design

Replications: 6
Design: Randomized Block
Size: 10’ X 30’
Statistics: Analysis of Variance

Results

The yields from the various treatments were not significant; however, there was a trend for a yield response from different fertilizer applications. Research at MU indicates many times the starter fertilizer response is from the nitrogen portion of the starter. This type of placement would best fit cash rent situations.



By: Robert Kelly
Regional Agricultural Business Specialist

Introduction

Farmers are continually exploring ideas for alternative crops in hopes of bolstering their income. With the weather variability experienced in the region, rainfall sometimes doesn't fall at the right times or in sufficient amounts to produce maximum corn yields. To help determine if grain sorghum, milo, is a potential alternative crop for corn in northwest Missouri, a study was initiated to look at yields and comparable planting dates to help determine if milo could replace corn as a viable alternative crop.

Methods and Materials

The second and third years of this study provided a look at drastically different weather than the first year. The plots received abundant and timely rains in both the second and third years. The yield results from this year show excellent yields again as opposed to the reduced yields of the first year.

The three plots this year were, early planted corn, corn planted the same day as the milo and milo. Corn was planted at 28,800 plants per acre and the milo was planted at 102,636 plants per acre.

Results

Yields this year and last year were excellent for both plantings of corn. Yields for 2005 are shown in Table 1. Rainfall in 2005 was timely and abundant leading to excellent corn yields and reduced milo yields. Total rainfall for the year was 25.57 inches during the growing season.

Treatment	Adjusted Yield Bu/acre
Regular Corn	218.0
Late Corn	167.8
Milo	48.3

Table 1 - 2005 Corn and Milo yield results.

Income form the three plots was as follows:

Early corn	218.0 * $1.95	= $425.10
Late corn	167.8 * $1.95	= $327.21
Milo	48.3 * $1.89	= $ 91.29

Based on this year's results, it would have been a disadvantage to have planted milo based on the returns Correspondingly, the economic analysis has shown that the year that milo out-yielded the corn the income was better and the net income per acre was higher than for the corn. The other two years with reduced milo yields, even the lower production costs were not enough to offset the yield/income advantage for corn.

This study is slated to continue for at least two more years.

Effect of Changing from No-till to Chisel Disk Tillage System on Corn and Soybean Yields

Objective

A tillage pan existed at this plot site in 2004. Soybean yields at the site were less than 20 bushels per acre. Water management and compaction are always a concern of growers in the Missouri river bottom regarding heavy, clay soils. The demonstration was designed to show the impact of breaking up the tillage pan.

Methods & Materials

The plots were fall chiseled twice in the fall of 2004 and no-till plots remained unchanged. Both corn and soybean demonstrations were established.

Crop Management Info

Planting Date : May 5, & May 20, 2005
Herbicides: Dual + Atrazine for corn
Roundup for soybeans
Hybrid: Golden Harvest H9359 corn
Garst 120310 soybeans
Insecticides: Lorsban on corn
Population: 28,500 seeds/acre corn
162,000 seeds/acre soybeans
Row Width: 30-inch

Demonstration Design

Replications: 6
Design: Randomized Block
Size: 15' X 50'
Statistics: Analysis of Variance

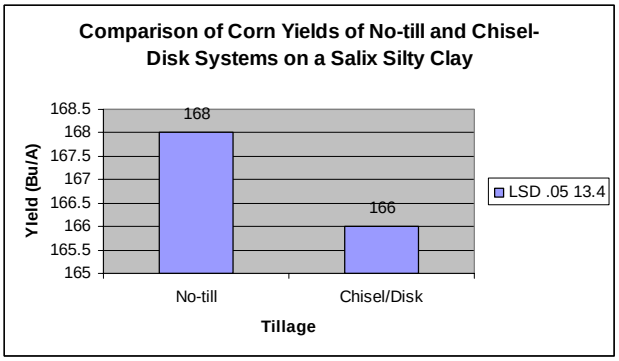
Results

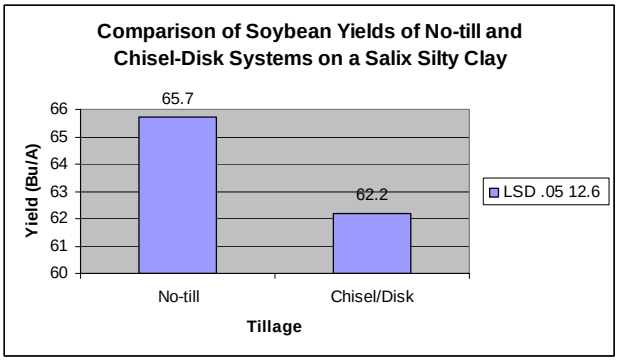
The effect of compaction on crop yields is difficult to predict. The low soybean yields of the previous season, in my opinion, were from compaction and low soil test pH. The plot area was very compacted. However, the results from corn and soybean plots indicate that compaction did not impact yield this season.

Crop yields are affected by compaction during planting by the placing and covering of the seed. Secondly, in very wet springs, water pools in the compacted area and we may have stand loss which can reduce yield. Thirdly, when the soils turn dry during the growing season, plant roots have a difficult time penetrating and passing through a compaction layer. Good soil moisture through the season generally lessens the effect of any tillage pan.

The results indicate a trend in both tillage systems of lower yields after tillage but the results were not significant. No-till creates better soil structure than tilled fields and once no-till is disturbed, the soil must go through the process of rebuilding the structure. The yield differences are typical of long-term tillage systems demonstration at Graves/Chapple Farm. Also, data in Nebraska and Iowa show a similar no-till yield advantage.

The soil pH of the area ranges from 5.2 to 5.4. An area next to this location has been devoted to a no-till liming demonstration.





Objective

Demonstrate the impact of corn stand loss on yield.

Methods & Materials

Corn was planted and thinned to 6 different populations at the V-4 growth stage.

Crop Management Info

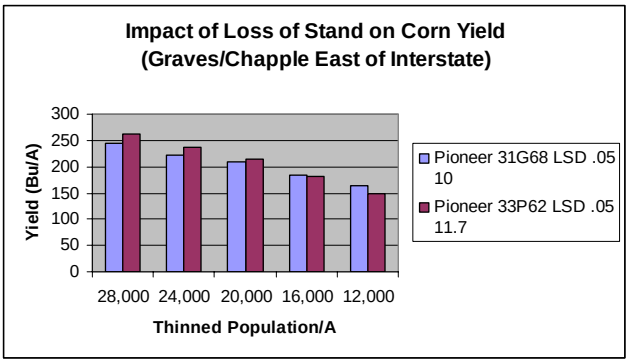
Planting Date : April 18
April 25
May 5
Herbicides: Dual + Atrazine
Hybrid: Pioneer 31G68
Pioneer 33P62
Golden Harvest H9359
Insecticides: Lorsban
Population: Thinned in treatments
Row Width: 30-inch

Demonstration Design

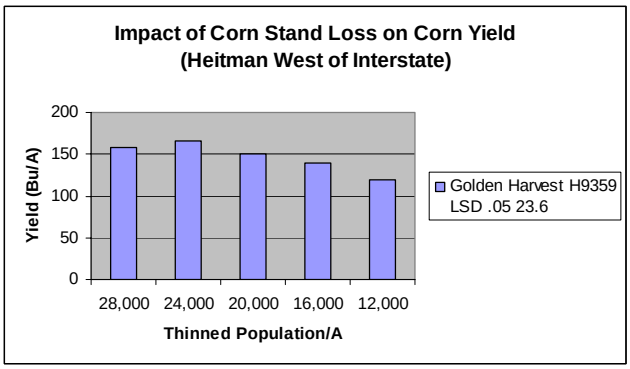
Replications: 3
Design: Randomized Block
Size: 10' X 30'
Statistics: Analysis of Variance

Results

The Pioneer Hybrid 31G68 was planted April 18 and Pioneer 33P62 was planted April 25. The data indicates a significant yield decline as corn population was lost. It is important to realize that the yield potential of this location is over 200 bushels.



Another hybrid, Golden Harvest H9359 planted May 5, was hand thinned at the Heitman farm location on the west side of Interstate 29. This location contains a heavy, poorly drained soil with a lower yield potential. Populations greater than 24,000 did not indicate a yield loss.



Objective

Demonstrate the effectiveness of different dry nitrogen sources on winter wheat yields.

Methods & Materials

Truman soft winter wheat was planted late October of 2004. The wheat was no-tilled into corn residue. Ammonium nitrate, ESN (polymer coated urea manufactured by Agrium) and urea were used as fertilizer sources. The ESN and Urea were combined as a treatment in a ratio of 25% ESN and 75% Urea.

Crop Management Info

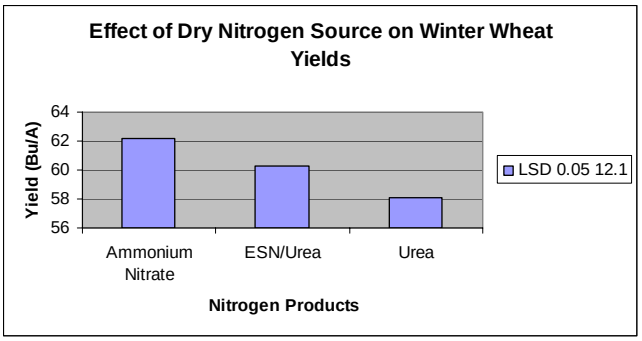
Planting Date : Late October
Herbicides: None
Hybrid: Truman soft red winter
Insecticides: None
Population: Thinned in treatments
Row Width: 9-inch

Demonstration Design

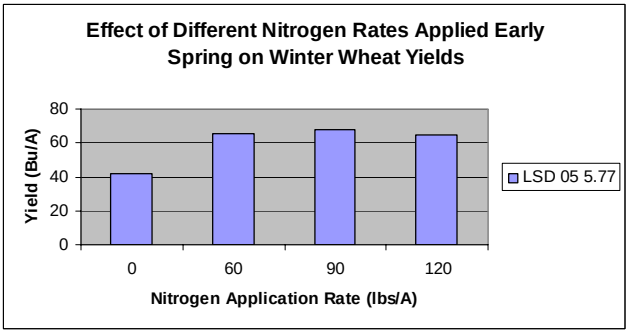
Replications: 3
Design: Randomized Block
Size: 15' X 30'
Statistics: Analysis of Variance

Results

There was not any significant difference in dry nitrogen sources.



There was a significant yield increase from the 0 to 60 pound nitrogen rate across all forms of nitrogen. However, there was not a significant yield increase beyond 60 pounds.



Objective

Demonstrate the impact of planting date and seed treatment on no-till.

Methods & Materials

Corn was planted at five planting dates, with or without Poncho 250 seed treatment.

Crop Management Info

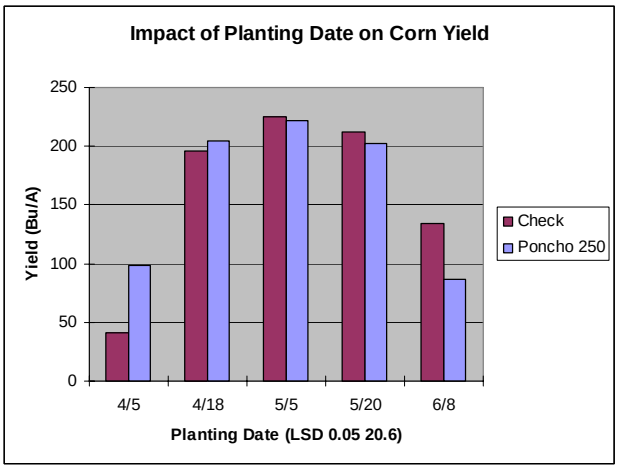
Planting Date : According to treatment
Herbicides: Dual + Atrazine
Hybrid: Pioneer 31P68
Insecticides: None except treatment
Population: 28,500 seeds/acre
Row Width: 30-inch

Demonstration Design

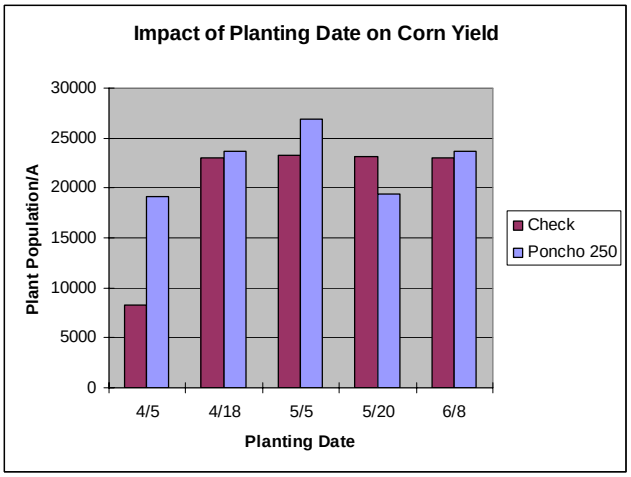
Replications: 3
Design: Split Block
Size: 10' X 30'
Statistics: Analysis of Variance

Results

Corn yields from the early planting date were impacted by the loss of stand. Poncho 250 gave some protection against white grub but loss of plants from the April 5 planting occurred in both treated and untreated plots. However, the value of the seed treatment was great at the April 5 planting date. The corn yield of the last planting date was impacted by waterhemp weed competition. MU research indicates that yields do not decline this drastically during the first part of June as compared to this demonstration.



The population from the early planting was reduced from white grub injury. Also, the stress of repeated frosts thinned plants at the April 5 planting date. MU research indicates that if you are going to plant the first week of April, you need to increase your seeding rate to compensate for the loss of plants.



Notice that all planting dates except the May 5 planting date with Poncho lost a significant amount of plants even though the demonstration was planted at 28,500 plants/A. Be sure to measure your harvest plant population and use this information to determine how much stand loss is occurring in your fields.

Demonstrate the Effect of Planting Date on Tassel Emergence

Objective

Demonstrate the impact of planting date on tassel emergence of corn.

Methods & Materials

Three corn hybrids were planted April 5 and April 18. The hybrids were Pioneer 34B24, Pioneer 33P62 and Pioneer 31G68. The date of tassel emergence (VT) was recorded when 10% plants reached this stage.

Crop Management Info

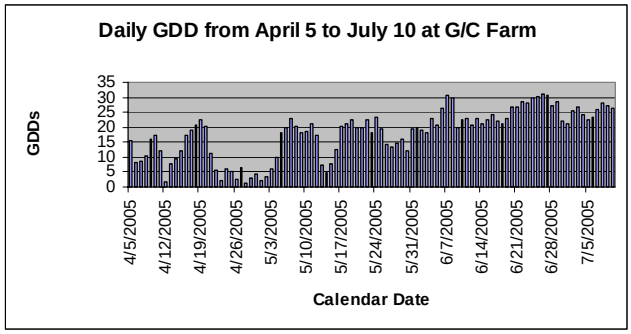
Planting Date : April 5
April 18
Herbicides: Dual + Atrazine
Hybrid: Pioneer 34B24
Pioneer 33P62
Pioneer 31G68
Insecticides: Lorsban
Population: 28,500 seeds/acre
Row Width: 30-inch

Demonstration Design

Replications: 3
Design: Randomized Block
Size: 10' X 30'
Statistics: Analysis of Variance

Results

Repeated frosts and slow growing degree day (GDD) accumulations during the last of April and first part of May resulted in slow growth of corn.



VT was difficult to determine with the amount of variability of the first planting date resulting from multiple frosts. The decision was made to make observations of the non-frosted plants for VT dates to give an appropriate comparison. The GGDs needed to reach VT were greater than expected compared to company data.

Hybrid	CMR	Measured Avg. GDD Days to VT Planted April 5	Measured Avg. GDD Days to VT Planted April 18
Pioneer 34B24	110 day	1554	1467
Pioneer 33P62	115 day	1627	1458
Pioneer 31G68	118 day	1574	1458

The later planted corn reached VT with less GDDs compared to the early planted corn. However, according to calendar date, the later planted corn reached VT, in general, 2-3 days later. The yield data will not be reported because of stand loss and weed competition from loss of plants for the April 5 planting date.

To reduce risk from drought stress, plant the earliest hybrid first followed by medium and longest maturity last. Longer season corn hybrids will speed their growth at late planting dates.

Objective

Demonstrate the effectiveness of different fungicides on soybean rust. The demonstration was setup to have an early treatment of Quadris; then, if soybean rust appeared, use the plot area for other fungicide treatments as a split plot design.

Methods & Materials

Quadris fungicide was applied at 12.3 ounces per acre. The label indicates rates of 12.3 to 15.4 oz/A for control of Anthracnose, Alternaria Leaf Blight, Brown Spot, Cercospora Blight and Leaf Spot, Frogeye Leafspot and Pod and Stem Blight. Aerial control of blight and soybean rust have labeled rates of 6.2 to 15.4 oz/A. The application was made July 21 at the R5 stage. The center four rows of the six row plots were harvested for yield.

Crop Management Info

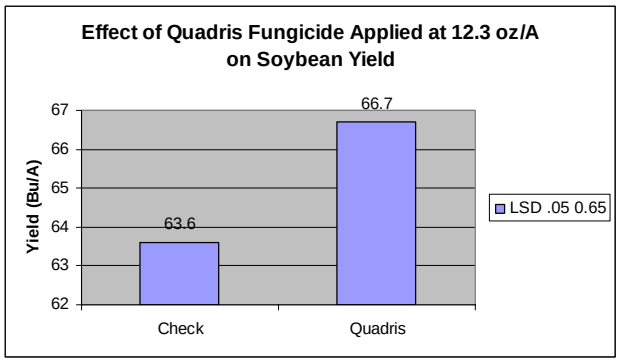
Planting Date : May 10
Herbicides: Roundup
Hybrid: Garst 120310
Insecticides: None
Population: 162,000 seeds/acre
Row Width: 30-inch

Demonstration Design

Replications: 3
Design: Randomized Block
Size: 15' X 520'
Statistics: Analysis of Variance

Results

Yield was significantly increased with the fungicide application with LSD (0.05) of 0.65 bushels.



Performance of Non-irrigated Corn Hybrids evaluated at the Graves - Chapple Farm during 2005

Planted - May 4, 2005
Harvested - October 15, 2005
Planted rate - 29,900 seeds/acre
Row Spacing - 30 inches
Tillage - No-till
Soil Type - Haynie Silt Loam

Fertilizer - N=240 lbs per acre
Pre-Herbicide - Harness, AAtrex, Gramoxone
Post-Herbicide - Distinct
Previous Crop - Soybeans
Check variety - Golden Harvest H9359
Check Average - 193.7 bu/acre

Growing Season Rainfall: Apr.= 6.43, May = 3.97, June = 4.12, July = 5.03, Aug .= 6.02, TOTAL = 25.57 in.

Yellow Corn Variety	Harvest Moisture %	Adjusted Yield bu/acre
Pfister 3356RRBt	16.0	240.0
Mycogen 2T780	17.5	221.2
NK N76-D3	16.3	218.2
Triton Genetics 9679	16.3	218.2
WyffelsW86033	17.0	217.2
Triton Genetics 9888	16.1	212.9
Burrus 7945	15.6	211.3
Golden Harvest H9209Bt	15.6	211.3
Golden Harvest H9190HX	15.8	201.6
NK N70-T9	15.9	201.4
Wyffels W6613	15.8	200.2
Best 6677	16.5	198.0
Best 744RRCB	15.3	196.4
Wyffels W8720	15.8	195.2
Burrus 679HL	15.4	192.4
Burrus 484S	16.2	190.3
Triton Genetics 9461	15.2	190.1
Burrus 717	16.1	189.7
NK N65-C5	15.6	189.6
Pfister 2730P250	16.1	187.7
Mycogen 2P786	15.4	186.6
Wyffels W7260	16.5	186.2
Taylor 955RR Bt	15.3	185.0
Golden Harvest H9251Bt	15.2	181.4
Golden Harvest H8713Bt	15.8	174.7
Best 6605	15.8	174.2
Best 6640E	15.3	156.7
Hoegemeyer HBt705	15.8	149.5
2005 Corn Trial Average	**15.9**	**195.6**
Standard Deviation	**0.5**	**19.5**

Performance of Non-irrigated Soybean Hybrids evaluated at the Graves - Chapple Farm during 2005

Planted - May 24, 2005
Harvested - October 26, 2005
Planted rate - 188,500 seeds/acre
Row Spacing - 30 inches
Tillage - No-till
Soil Type - Haynie Silt Loam

Pre-Herbicide - Boundry, Touchdown Total
Post-Herbicide - Touchdown Total, Select
Previous Crop - Corn
Check variety - Stine 3832-4
Check Average - 63.1 bu/acre

Growing Season Rainfall: Apr.= 6.43, May = 3.97, June = 4.12, July = 5.03, Aug.= 6.02, TOTAL = 25.57 in.

Soybean Variety	Harvest Moisture %	Adjusted Yield bu/acre
Taylor 353RR	10.9	72.3
Willcross RR2386	10.6	71.9
Stine 3942-4	10.7	67.8
Atlas 5B381NRR	10.8	64.9
Stine 3932-4	13.7	64.8
Stine 4102-4	13.7	64.2
Atlas 5N391RR	13.8	63.8
Stine 3600-4	10.6	63.8
Willcross RR2386NX2	10.9	63.5
Willcross RR2335N	10.9	63.5
Willcross RR32355N	13.7	63.2
NK S37-N4	13.7	62.9
Westland 32R6	11	62.7
NK S39-K6	10.9	62.5
Willcross RR2385NSTS	10.4	62.5
Willcross RR51345N	13.8	62.4
Westland 37R2	10.6	62.1
Hoegemeyer 381NRS	11.1	62.1
WillcrossRR2355N	11.1	61.9
Westland 38R6	10.8	61.1
Hoegemeyer 391NRR	11	60.8
Westland 35R5	13.5	59.9
Hoegemeyer 357NRR	11	57.6
Hoegemeyer 425NRS	13.4	56.9
2005 Soybean Trial Average	**11.8**	**63.3**
Standard Deviation	**1.4**	**3.5**

Effect of Gypsum on Soybean Yield

Objective

Demonstrate the effect of gypsum as a soil amendment to heavy clay soil in the Missouri river bottom. The goal is to improve drainage resulting in increased yield.

Methods & Materials

Soybeans were planted in plots that had gypsum applied in the spring of 2004. The treatments were 300, 500 and 1,000 pound rates and a control.

Crop Management Info

Planting Date : May 11, 2005
Herbicides: Roundup
Hybrid: Pioneer 93M11
Insecticides: None
Population: 162,000 seeds/acre
Row Width: 30-inch

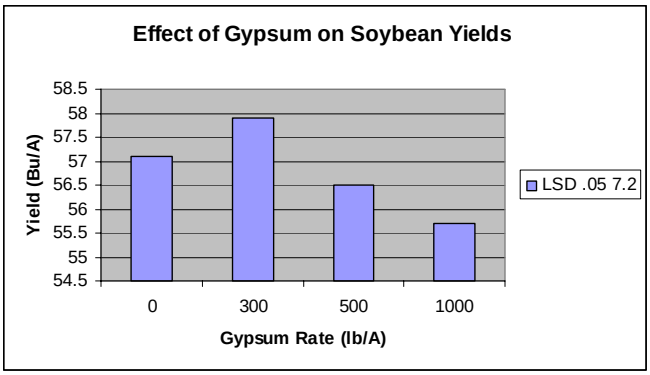
Demonstration Design

Replications: 5
Design: Randomized Block
Size: 10' X 40'
Statistics: Analysis of Variance

Results

The effect of gypsum applied in 2004 resulted in no corn yield advantage. This year's soybean demonstration also indicates there is not a significant yield increase from the gypsum treatments.

Gypsum is typically used in western states to flush sodium through the soil profile. Sodic soils are quite noticeable as a white crust on the soil surface in eastern Colorado, western Kansas and Oklahoma.



The 17th annual Graves - Chapple Farm Field Day was held on August 23, 2005. Over 150 participants registered at the event.

The Atchison County Farm Bureau and the Missouri Soybean Association provided free soy flour doughnuts to the attendees. A pulled pork lunch was sponsored by the farm with ice cream sandwiches provided by MO Valley Ag. KMA Radio from Shenandoah and KFEQ Radio from St. Joseph conducted live remote broadcasts from the farm during the event.

Red Tour – Corn Tour

Stop 1 - *Nitrogen Application Rate, Product and Timing* Wayne Flanary

Stop 2 - *Replant Desicions*
Travis Belt

Stop 3 - *Milo: An Alternative Crop for NW MO?*
Bob Kelly

Stop 4 - *Rootworm/Wireworm Update*
Wayne Bailey

White Tour – Soybean Tour

Stop 1 - *Current Status of Soybean Rust*
Laura Sweets

Stop 2 - *Soybean Aphid Update*
Erin Marlow

Stop 3 - *Nozzle and Tip Selection for Fungicide Application*
Julie Abendorth

Stop 4 - *Fall Applied Herbicide Programs*
Jim Wait

Blue Tour – Alternative Crops

Stop 1 - *Soil Compaction and the Effect on Yield*
Craig Smith

Stop 2 – *Buffer Strips as Wildlife Food Plots*
Louis Byford

Stop 3 – *New Forages*
Amie Schleicher

Stop 4 - *Wheat and Soybeans as Forage*
Shawn Deering

Inside the Main Bldg -
The Nuts and Bolts of Yield Monitoring - Improving the Bottom Line
Kent Shannon

After lunch concluded an additional walking tour was conducted to allow attendees to get some up-close, hands-on experience with several additional topics. The topics covered by tour leader Wayne Flanary included:

Tillage Pans
Soybean Fungicides
Gypsum in Crops
Soybean Seed Treatments

Ninety-six high school students from four area schools attended the first Student Field Day at the Graves-Chapple Farm on September 15. The theme for the day was "The Future of Agriculture". Most of the attendees are familiar with the production segment of agriculture. Therefore, presenters focused on the fact that the production part of agriculture is a very tiny piece of the overall agriculture system.

Each of the five learning stations was designed to provide hands-on learning opportunities for the students on some of the cutting edge technology used in today's agriculture. The five learning stations were: Wayne Flanary, MU Extension regional agronomist, talked about biotechnology and genetics in today's row crops; Erin Marlow MU Extension regional agronomist, showed various insects and talked about the damage they cause; Kent Shannon, state extension specialist, demonstrated how yield monitors and computer technology are used in today's agriculture; CeCe Leslie, MU recruiter, handled out information on undergraduate programs at MU; and Dr. Tom Zweifel talked about opportunities in agriculture at Northwest Missouri State University.

Soy doughnuts were provided by the Atchison and Holt County Farm Bureaus. A lunch of hotdogs and hamburgers was provided by the farm and local area businesses and prepared by the Rock Port Rotary club.

2005 Graves - Chapple Farm
Daily Precipitation Data, April - September 2005

Daily Precipitation in Inches

Day	April	May	June	July	August	September
1			0.38	0.02		
2				0.04	0.01	
3			0.82			
4			0.67		0.10	
5						
6	1.92					
7						0.04
8		0.23			0.13	0.26
9			0.20		0.01	
10	0.36		0.68			
11	1.46	0.21	0.54			
12	0.01	1.83	0.24		0.12	
13					5.11	
14						
15						0.08
16	0.05					
17				0.19		
18	0.12			1.45		
19					0.30	
20	0.62					
21	1.66					
22	0.04					
23						
24					0.01	
25	0.12	0.04		0.47		
26		0.01		2.86	0.10	
27		0.01				
28	0.07	0.03	0.47		0.12	0.12
29			0.04		0.01	
30			0.08			
31	---	1.61	---			---
TOTAL	6.43	3.97	4.12	5.03	6.02	0.50

Daily Temperature in °Fahrenheit

Day	April Max/Min	May Max/Min	June Max/Min	July Max/Min	August Max/Min	September Max/Min
1	60/34	54/34	78/62	82/60	91/71	84/54
2	67/27	57/34	80/58	87/65	92/74	81/61
3	84/40	62/34	74/63	87/68	94/77	89/60
4	82/58	70/39	82/63	84/64	83/64	89/69
5	72/59	74/46	81/61	90/59	83/59	88/69
6	63/53	84/55	89/66	87/61	86/54	86/68
7	67/45	82/64	90/72	89/66	92/62	87/68
8	70/35	83/57	87/72	91/70	92/72	89/69
9	76/54	80/56	77/63	92/69	94/73	90/70
10	75/59	91/51	82/63	91/67	95/70	90/71
11	72/52	80/63	81/65	92/67	92/75	88/70
12	53/42	76/59	80/62	92/68	78/70	89/73
13	66/48	65/49	82/64	91/69	71/62	81/59
14	69/36	59/40	82/60	93/65	77/58	79/52
15	74/43	66/38	86/60	94/67	82/59	72/51
16	79/55	75/45	85/63	95/66	83/59	77/47
17	82/56	81/60	84/61	94/71	83/63	77/55
18	80/61	81/62	85/57	88/67	96/71	85/65
19	81/64	92/53	87/60	85/66	87/70	90/63
20	79/62	85/54	90/67	94/76	91/66	93/54
21	72/51	84/56	92/68	92/77	88/69	96/66
22	61/45	86/59	92/71	95/78	85/68	86/63
23	55/35	90/50	92/71	98/80	78/66	72/55
24	62/31	82/65	95/74	95/75	77/67	90/64
25	61/37	86/53	95/75	95/73	84/72	92/66
26	55/38	78/48	94/76	74/57	88/70	77/53
27	63/35	76/51	96/75	76/53	90/59	83/51
28	52/38	80/45	91/69	82/54	89/61	65/42
29	56/34	76/57	93/71	86/68	87/58	70/35
30	59/32	73/51	79/65	88/69	88/57	81/50
31	---	80/59	---	89/71	88/59	---

2005 Variety Demonstration Participants

Best Seeds
% Alan Voiles
P O Box 45
Eldred, IL 62027
Phone: [1] 800-556-8406

Burrus Power Hybrids
M.G. Kennedy
237 NE 20th St
Trenton, MO 64683
Phone: [1] 800-529-7475

Golden Harvest Seed
% Janet Wennihan
33174 U.S. Hwy 136
Tarkio, MO 64491
Phone: [1] 660-736-4748

Hoegemeyer Hybrids
% Devon Liston
1755 Hoegemeyer Road
Hooper, NE 68031
E-mail Address: askus@hoegemeyer.com
Phone: [1] 402-654-3399

Morning Sun Seed/Westland Seeds
% Mike Herrick
13919 R. Ave
Westboro, MO 64498
Phone: [1] 660-984-5604

Mycogen Seeds
% George Bauer
1617 190th Street
Hiawatha, KS 66434
E-mail Address: ggbauer@dow.com
Phone: [1] 785-547-3526

Pfister Hybrids
% Doug Walsh
10920 N. Donnelly Ave
Kansas City, MO 64157
E-mail Address: wdwalsh@pfisterhybrid.com
Phone: [1] 816-665-2949

Stine Seed Co
% Tim Henning
9101 N Stark Ct
Kansas City, MO 64157
E-mail Address: timhenning@henningbough.com

Syngenta Seeds Inc.
% Jim Waggoner
1119 White Oak Court
Liberty, MO 64068
E-mail Address: jim.waggoner@syngenta.com
Phone: [1] 816-781-8144

Taylor Seed Farms
% Aaron Jelinek
9903 North Highland Terrace
Kansas City, KS 64155
E-mail Address: aaronjel@kc.rr.com
Phone: [1] 816-734-4033

Willcross
% Randall Hill
4564 US Highway 169
King City, MO 64463
Phone: [1] 660-535-4444

Wyffels Seed
% Dan Lahue
25482 G Ave
Rock Port, MO 64482
E-mail Address: Tlahue@wyffels.com
Phone: [1] 660-744-5792

http://extension.missouri.edu/atchison/Graves/Main%20page.htm

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For additional copies or for more information contact:

University of Missouri Extension Center
201 HWY 136 East
Rock Port, MO 64482
Phone: (660) 744-6231
Email: AtchisonCo@missouri.edu

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