Joliet Junior College

J.F. Richards Land Laboratory

Demonstration & Research Guide

2011

JOLIET JUNIOR COLLEGE
1901

Table of Contents

Corn

Soybeans

Joliet Junior College

Joliet Junior College, 1215 Houbolt Road, Joliet, Illinois 60431 *www.jjc.edu*

Acknowledgments and Contributors

Many people have contributed numerous resources to the J.F. Richards Land Lab Demonstration and Research Farm during the 2011 growing season. A few of those resources included equipment, pesticides, seed, cash, and chemicals to help the farm throughout the year. These people are listed below. On behalf of Joliet Junior College, I would like to thank these people for supporting the Joliet Junior College Agricultural and Horticultural Sciences Department through their generous donations.

A few people that I would like to give some extra thanks to this year include Andy Rousonelous. Andy has donated much time and energy to help me throughout the growing season. Andy was there during the summer and mostly throughout harvest. He was at the farm every day during harvest helping to keep the equipment moving and also hauled all of the grain to the elevator. A special thanks also to John Cronin. Both John and Andy helped set up and keep the Field Day moving according to schedule. John allowed us to use his tractors for the field day and both John and Andy drove them during the field tours. A special thanks to Josh Mair, the J.F. Richards Land Lab intern for the summer who was responsible for assisting me throughout the summer and keeping up the grounds around the farm throughout the growing season. Finally, a special thanks to all of the students and faculty that assisted during the entire growing season and also at the field day this year.

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This following is a list of contributors and companies that have donated their time and resources to the Joliet Junior College Demonstration and Research Farm in 2011.

Last	First	Organization
Bleuer	Bob	Bleuer Farms
Bob	Lawless	Syngenta
Bugg	Mark	Becks
Davis	Ken	Stone
Gill	Mike	Monsanto
Higgins	Russ	U of I Extension
Hill	Alan	Golden Harvest
Hoskey	Jeremy	BASF
Laggar	Scott	Elburn Coop
Lutz	Jon	Syngenta
Maxwell	Doug	U of I
Moon	Eric	Helena
Morrison	Jim	U of I Extension
Mueller	Dennis	Burrus
Myers	Dave	Monsanto
Nelson	Jim	Illinois Soybean Association
Orns	Merrill	Sun Prairie
Parsell	Barry	Garst
Perry	Kacy	Monsanto
Phelps	Sam	Del Monte
Scheele	Art	American Organic
Shelby	Ryan	Pioneer
Skonetski	Bill	Dairyland
Walz	Wayne	Pioneer
Wesemann	Rebecca	Advanced Crop Care
Wessel	Jeff	Pioneer

J.F. Richards Land Lab

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Introduction

The Joliet Junior College Demonstration and Research Farm began operation in 1983 by the generous donation of the Richards family. The Richards family previously owned the land that is now the main campus of the college. The main objective of the farm is to provide an instructional setting for students to utilize during their research and classes, demonstrate crop responses to various farming practices giving students a first hand observation of crop growth and development, and to provide unbiased, sound agronomic research information to crop producers.

The land lab is used by both faculty and students for educational purposes. Students are able to experience all aspects of production farming and apply it to their classroom settings. The students are able to work with their instructors to assist in management decisions of the farm. All agriculture classes utilize different aspects of the farm to enhance their studies in the classroom. Students enrolled in Soils and Fertility will study soil types and fertility levels. Crops classes look at cropping systems, yield calculations and plant growth and development. Crop Protection classes will look at disease, insect, and weed pressure. Marketing students will utilize crop yields and prices to market grain. Mechanics students will learn the proper operation and adjustment of machinery to maximize equipment use and efficiency.

The Demonstration and Research Farm consists of 94 acres with 50 being corn and 44 being soybeans in 2011. Studies on corn this year included rootworm management, compaction issues, nitrogen application and timing, and fungicide timing. Studies on soybeans this year included varying inputs to maximize yields, tillage and planting date trials, fertility differences, and early vs. late planted soybeans. There was also both a corn hybrid and soybean variety plot included on the farm.

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Agricultural and Horticultural Sciences Faculty and Staff

Below is a complete list of faculty and staff in the Agricultural and Horticultural Sciences Department at Joliet Junior College. For more information or additional copies of the JJC Demonstration and Research Guide contact: Mike Szydlo at (815) 280-6602 or mszydlo@jjc.edu. To contact other staff members in the department call (815) 280-2320, or fax at (815) 280-6650.

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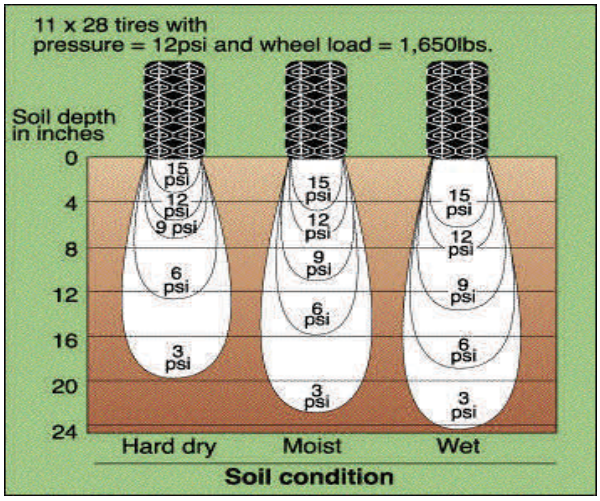
Roxanne Olson	Veterinary Technology
Lisa Perkins	Turf Management
Nathan Raye	Animal Science
Donna Theimer	Floral Design/Interior Plantscaping/Dept. Chair
Mike Szydlo	Farm Manager
Diane Vlna	Department Secretary

Compaction in Corn

Acres - 1.68 Planting Date - May 9th Harvest Date - October 26th

Driving equipment on ground that is not fit or too wet increases the chances of compacting soils.



Treatments

- **Previous Crop**

  Corn

- **Herbicides**

  Pre-emerge - Guardsman Max (4.2 pts),

  Showdown (32 oz.)

- **Hybrid**

  Garst 84G70

- **Tillage**

  None

- **Insecticides**

  None

Results

	Yield (bu/acre)
Compacted	112.8
Not Compacted	113.2

Summary

Farm machinery is continually getting larger and heavier and as farms to continue to grow in size, producers are pushed to get into the field earlier every year. If the weather is not cooperating, this often means that equipment is moving before the field is in the proper condition causing compaction. In this plot, a Case MXU 115 and loader carrying a pallet of paver bricks was used in four separate strips to compact the soil. This is the first year that we are testing this data in this location. Although the results only show a minor difference, we will continue to compact the ground every spring and take measurements every year of surface and subsurface compaction in order to see what kind of damage we are doing to the ground and how it affects yields.

Corn Fungicide Timing

Acres - 2.88 Planting Date - May 9th Harvest Date - October 23rd

Applying fungicides to a corn crop is not a simple decision to make.

Treatments

- **Previous Crop**

  Corn

- **Hybrid**

  Pioneer 35K09 and Dekalb 59-35

- **Insecticides**

  None

- **Tillage**

  Spring Disc

- **Herbicides**

  Pre-emerge - Guardsman Max (4.2 pts.)
  Roundup WM (12 oz.)

  Post-emerge - Showdown (32 oz.)

Results

Quilt	Yield (bu/acre)
None	158.6
V5	163.2
VT	162.2
V5 + VT	166.4
Headline	
None	152.9
V5	159.2
VT	158.6
V5 + VT	163.9

Summary

This plot was designed to study the yield differences of fungicide application timing. Fungicides are applied at V5, VT or both with a control. Two different fungicides were used to see if there was any differences between them. Each plot, Quilt or Headline, was replicated twice and the results are listed above. Even though the disease pressure was not as heavy this year as in previous years, there was still an increase in yield seen with the application of the fungicides. Both instances show a similar increase in a single application, either V5 or VT, and both fungicides show an even higher yield increase when used at both V5 at VT.

Continuous Corn Practices

Acres - 4.63 Planting Date - May 4th Harvest Date - October 15th

Residue management is one of the most important aspects of a continuous corn rotation.

Treatments

- **Previous Crop**

  Corn

- **Hybrid**

  Burrus 5A45 AM1

- **Insecticides**

  None

- **Tillage**

  Strip or Chisel

- **Herbicides**

  Pre-emerge - Dual II Magnum (1.33 pts.)
  Roundup WM (12 oz.)

  Post-emerge - Showdown (32 oz.)

Results

	Yield (bu/acre)
Chisel	110.4
Strip-Till	101.3

Summary

This study is a designed to look at the yield differences that various tillage systems have on a continuous corn system. The first consideration to note is that this is a continuous corn study that is studying the effects of tillage on continuous corn. Both strip tillage and conventional tillage with a chisel plow are used. Within each of these studies, nitrogen rates and the use of starter fertilizer are kept constant. In the study, 160 units of nitrogen was applied during the growing season. 40 units of nitrogen was applied as starter fertilizer and the remainder was applied at V5. When looking at the study as a whole, the chiseled plots out yielded the field that were strip tilled by 9 bushels. One of the most important things to note with this plot was the significant amount of ear drop at harvest time. The most likely cause of this was due to extremely high temperatures at silking time. High temperatures during this time are likely to cause a weak shank attachment. The plant can recover and still produce a normal amount of grain on each ear. However, the shank is still weakened and the weight of the ear will likely cause ear drop before harvest.

Nitrogen Rate and Application

Acres - 8.4 Planting Date - May 19th Harvest Date - October 25th

Finding different sources and application timing of nitrogen to maximize efficiency is important to obtaining the most profit.

Treatments

- **Previous Crop**

  Soybeans

- **Hybrid**

  Golden Harvest 8577 and Garst 85E98

- **Insecticides**

  None

- **Tillage**

  Spring Field Cultivate

- **Herbicides**

  Pre-emerge - Harness X-tra (1.5 qts.)
  Showdown (26 oz.)

  Post-emerge - Showdown (32 oz.)

Results

	Yield (bu/acre)
Control	165.9
Reduction	166.1
80# N + 3 gal CoRoN	167.5
120# N + 2 gal CoRoN	164.9

Summary

This plot is engineered by Helena chemical company. The purpose of it is to examine the differences of the nitrogen product CoRoN as a top dressed nitrogen source. The entire plot was planted May 19th at a rate of 32,000 seeds per acre and 40# N as starter fertilizer. At V5, the remainder of the nitrogen was applied. The control unit received an addition 120# N while the reduction only received 80 additional units. As you can see, there was no significant difference in yield with a 40 unit reduction. The third plot received 80 units of N sidedressed and 3 gallons of CoRoN per acre applied with a foliar applicator. This brought the total units of N to 160 which is the same as the control. There was a 2 bushel advantage to spoon feeding the nitrogen directly to the plant instead of injecting it into the soil. The results from the final plot show that it is not to our advantage, in this case, to add more than 160# throughout the growing season. It did not result in any type of increase over the control.

Nitrogen Recommendation Systems

Acres - 3.3 Planting Date - May 5th Harvest Date - October 22nd

Optimizing nitrogen rate and efficiency is always a goal of corn producers.

Treatments

- **Previous Crop**

  Soybeans

- **Hybrid**

  Pioneer 35K09 AM1

- **Insecticides**

  None

- **Tillage**

  None

- **Herbicides**

  Pre-emerge - Guardsman Max (4.2 pts.)
  Roundup WM (12 oz.)

  Post-emerge - Showdown (32 oz.)

Results

	Yield (bu/acre)
Farmer Practice	137.5
Farmer Practice + 40# N	146.8
N Rate Calculator	131.7
ISNT	134.1
Sensor	128.6

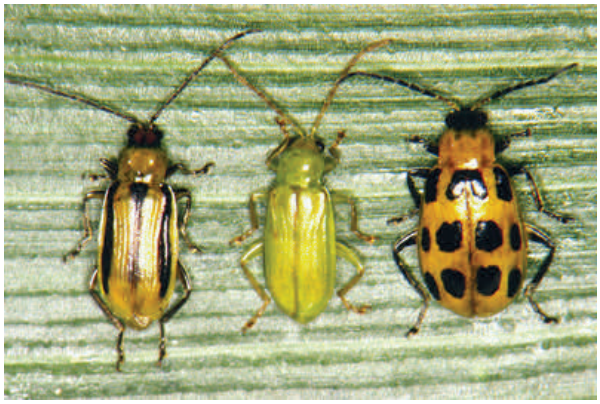
Summary

This plot is engineered by researchers at Pioneer and replicated numerous times across the state of Illinois. It shows the variability of nitrogen recommendations based on location and test type. There were 5 different nitrogen trials performed, some of the tests resulted in the same amount of nitrogen required. The first trial was a standard practice, applying 140# of N in between the rows at V5. The second was the same amount of nitrogen, 140# total only splitting it between 40# applied at planting and the remainder at V5. Results form the N Rate calculated were gathered from a 2 foot corn pulled in early April resulting in a sidedress application of 160# at V5. The ISNT test also resulted in 160# sidedressed at V5. A Greenseeker was used for the sensor plot and the results showed only a need of 110# N. The test was performed at V5 and the application was made the same day.

Corn Rootworm Control

Acres - 1.56 Planting Date - May 6th Harvest Date - October 20th

Corn rootworms are one of the biggest pests to corn producers in the Midwest today.



Treatments

- **Previous Crop**
  - Corn
- **Hybrid**
  - Burrus 7U17 (Control)
  - Burrus 7A18 (CRW)
  - Dekalb 62-97 (CRW)
- **Insecticides**
  - Force & Fortress
- **Tillage**
  - Fall Chisel, Spring Field Cultivate
- **Herbicides**
  - Pre-emerge - Dual II Magnum (1.67 pts.)
  - Post-emerge - Showdown (32 oz.)

Results

Treatment	Yield (bu/acre)
Burrus 7U17	168
Burrus 7U17 + Force	171
Burrus 7U17 + Fortress	171
Burrus 7A18	165
Burrus 7A18 + Force	166
Burrus 7A18 + Fortress	171
Dekalb 62-97 VT3P	169
62-97 VT3P + Force	171
62-97 VT3P + Fortress	170

Summary

The yield results gathered from the data were generally what would be expected. The plots with no insecticide applied at all yielded lower than any of the plots with insecticide applied. The yield increases from using insecticide, either Force or Fortress, were fairly insignificant. Most of them only showed a 1-3 bushel increase except for using Fortress on the rootworm resistant Burrus hybrid. The rootworm pressure was not very high this year. The roots were all dug, washed and rated during the summer with results ranging from 0.3 to 1.25. The highest number, 1.25, was found in the untreated Burrus number with no insecticide, however, this number is still considered fairly low for a seed variety with no rootworm protection at all.

Refuge-In-A-Bag Trial

JOLIET JUNIOR COLLEGE 1901

Acres - 4.16 Planting Date - May 6th Harvest Date - October 20th

Seed companies expect refuge in a bag products to be the hottest seed items sold for the next few years.

Treatments

- **Previous Crop**
  - Corn
- **Hybrid**
  - 10 new Dekalb refuge-in-a-bag blends
  - 2 Pioneer Refuge-in-a-bag hybrids
- **Insecticides**
  - Force (used only on 1 trial)
- **Tillage**
  - Fall Chisel, Spring Field Cultivate
- **Herbicides**
  - Pre-emerge - Dual II Magnum (1.67 pts.)
  - Post-emerge - Showdown (32 oz.)

Results

Treatment	Yield (bu/acre)
DKC 62-97 VT3P	135
DKC 61-21 SS RIB (95/5)	152
DKC 62-97 VT3P RIB (80/20)	130
DKC 61-21 RIB (100)	144
DKC 63-45 RR2	152
DKC 62-97 VT3P RIB (90/10)	157
DKC 61-21 JRM RIB Complete	173
DKC 61-21 SS 100% Complete	163
DKC 61-22 RR2	152
DKC 61-22 RR2 + Force 3G	169
Pioneer 1162 XR AM1 OAM1	152
Pioneer 1162 XR HXX	161

Summary

This plot was put together by researchers at Monsanto. Refuge-in-a-bag (RIB) is the newest and most promising line of seed coming from most seed companies in the next few years. This new line will ensure that farmers are fully meeting the refuge requirements. Monsanto's idea behind this was to combine the 5% insect control requirements with the convenience and simplicity of refuge in the bag. The new Genuity Smartstax RIB Complete series will meet requirements of above and below ground insect refuge management. The results seen above look promising both for insect control and yield. The yields results were, for the most part, typical of what we saw across the entire farm.

Corn Hybrids

Acres - 4.73 Planting Date - May 10th Harvest Date - October 22st

Corn hybrid plot at Joliet Junior College.

Summary

There were 43 entries in the corn hybrid demonstration. The average yield was 186.5 bu/ac. The yields ranged from 165.5 to 213.8 bu/ac. The lowest yielding hybrid was the Becks 5334 and the highest yielding number was the control used in the plot. Dekalb 62-97 was used as a control and averaged 201.3 bu/ac. which was significantly higher than the average for the entire plot. The corn was planted on May 10th at a rate of 34,000 seeds per acre with a 4 Kinze planter into zero-tilled soil. A pre-emerge application of Integrity at 16oz/ac and Showdown at 32 oz/ac were applied 2 days after planting. The yields in this plot were among the highest of the corn on the farm this year.

Variety	Yield	Relative Yield
	Bu/ Acre	%
Dekalb 62-97	213.8	115%
Pioneer 35F44	179.6	96%
GH H8940	186.2	100%
Dekalb 63-84	209.3	112%
DSR 9206SXX	181.9	98%
Becks 5269HXR	191.6	103%
Dekalb 62-97	206.1	111%
Stone 61-28	193.6	104%
Dekalb 59-35	183.9	99%
DSR 9313SXX	172.9	93%
Pioneer 0533XR	177.8	95%
Sun Prairie 2705	185.1	99%
Dekalb 62-97	193.3	104%
Pioneer 1018AM1	179.4	96%
Garst 83R38	195.1	105%
DSR 9214Q	181.1	97%
Dekalb 57-50	195.6	105%
Becks 5442	190.2	102%
Dekalb 62-97	196.7	105%
Stone 5803	179.0	96%
Pioneer 0832AM1	188.8	101%
Garst 85V88	182.3	98%
Dekalb 58-83	188.9	101%
GH H9002GT	175.5	94%
Dekalb 62-97	199.8	107%
Burrus 4A30AM1	175.4	94%
Dekalb 55-09	181.5	97%
DSR 9213Q	178.6	96%
Becks 5334HXR	165.5	89%
Sun Prairie 617GSS	174.2	93%
Dekalb 62-97	198.1	106%
Becks 5435HXR	172.8	93%
Garst 83F08	190.3	102%
GH H8969	179.3	96%
Pioneer 0916AM1	177.3	95%
Stone 5913	188.2	101%
Dekalb 62-97	193.6	104%
Hughes 4125	180.0	97%
Dekalb 61-21	187.8	101%
Pioneer 1319AM1	168.4	90%
GH H8928GT	185.5	99%
Becks 6077HR	185.4	99%
Dekalb 62-97	208.6	112%

Soil Fertility

Acres - 6.86 Planting Date - May 11th Harvest Date - October 18th

Properly applying fertilizer based on soil sample results is the simplest way to ensure proper nutrients for your crop.

Treatments

- **Previous Crop**

  Corn

- **Hybrid**

  Dairyland Seed 3017

- **Insecticides**

  None

- **Tillage**

  None

- **Herbicides**

  Warrant (3 pts.) Touchdown (28 oz.)

Results

Fertility	Yield (bu/acre)
Normal	60.6
Basic	51.0
Acidic	55.1
No P	58.5
No K	52.3
No P & K	51.75

Summary

The results seen in this plot are generally what would be expected. The lack of one nutrient, P or K, or a lack of both of them together will cause a yield reduction. Soil samples were taken this fall just after harvest with the help of Advanced Crop Care. The samples were tested and the results were not as diverse as expected. The study was implemented in 2000 and now has 11 growing seasons on the same soil. Fertilizer applications have remained the same the entire time. This plot will not change next year and 50# P_2O_5 and 50# K_2O will be put in the proper strips this spring before corn is planted. Soil samples will be taken again in the fall of 2013 and then again every 2 years to study changes in fertility.

Tillage By Planting Date

Acres - 6.75 Planting Date - April 12th, May 11th, May 21st Harvest Date - October 18th

There are many different types of tillage operations Midwestern farmers may use.

Treatments

- **Previous Crop**

  Corn

- **Hybrid**

  NK S27-C4

- **Tillage**

  No-till, Strip, Chisel

- **Herbicides**

  Pre-emerge—Warrant (3 pts.)

  Touchdown (28 oz.)

  Post-emerge - Showdown (32 oz.)

Results

	Tillage System		
Planting Date	Zero	Strip	Chisel
	Yield (bu/acre)		
Early	51.7	49	41.7
Normal	66.3	64.6	60.3
Late	66.1	67.4	58.3

Summary

The biggest yield variation we see in this plot is with the early planted soybeans. No matter what tillage system was used, the yield was significantly less. These soybeans were in the ground in severe cold and wet conditions for two weeks before they emerged. These conditions caused a yield decrease of 14-18 bushels across the three different tillage systems. The no-till and strip-till plots yielded 5-7 bushels higher than the ground that had chiseled the previous fall. Although it is becoming more popular to plant soybeans early, it is important to be aware of the risks to the seeds when the weather does not cooperate. When looking at the results from the three tillage systems and later planted soybeans, the deepest tillage system had the most negative impact on yields.

High Yield Soybeans

Acres - 3.9 Planting Date - May 11th Harvest Date - October 18th

High yielding soybeans are achieved through improved and targeted management decisions.

Treatments

- **Previous Crop**

  Corn

- **Hybrid**

  Pioneer 92Y80

- **Tillage**

  None

- **Herbicides**

  Pre-emerge—Warrant (3 pts.)

  Touchdown (28 oz.)

  Post-emerge - Showdown (32 oz.)

Results

	Yield (bu/acre)
Control	59.6
Seed Treatment	62.3
Seed Treatment/Foliar Pesticide	63.1
Treatment/Pesticide/100# N	64.3

Summary

This plot is put on by Pioneer and replicated across the state. The main purpose is to add more variables with each additional trial to see how each will affect the yield and what would be most economical for the producer. All of the plots are planted at 150,000 seeds per acre in 30 inch rows. The first plot is a popular soybean number, 92Y80, with no modifications. Then, a seed treatment is added, followed by the treatment with a foliar pesticide. The final step is to utilize those variables and sidedress 100# N at the R2 stage. This plot shows that with the addition of each variable, we will see a slight yield increase. It is important to look at the economics of these results as well. Seed treatments and foliar pesticides are fairly inexpensive and a slight yield increase will make them pay. Applying nitrogen is more costly and will require more of a yield increase in order to make it cost-effective.

Managing Early Planted Soybeans

Acres - 3.68 Planting Date - April 13th (Early) May 23rd (Late) Harvest Date - October 3rd

Early planted soybeans promote rapid crop growth during flowering and pod set and also increase number of seeds per acre.

Treatments

- **Previous Crop**

  Corn

- **Hybrid**

  Pioneer varieties (92Y80 and 93Y82) both treated and untreated

- **Tillage**

  Spring Disc

- **Herbicides**

  Warrant (3 pts.) Touchdown (28 oz.)

Results

Early (April 13)	Treated	Yield (bu/acre)
92Y80	No	62.6
	Yes	66.4
93Y82	No	64.7
	Yes	66.2
Late (May 13th)		
92Y80	No	61.75
	Yes	61
93Y82	No	62.8
	Yes	60.5

Summary

This plot was established by Pioneer and replicated across the state. It was intended to study the effects of seed treatment at two different planting times, as early as conditions allow and then again very late as compared to the rest of soybean planting. The early platning date, April 13th, was the first seed planted on the farm this year, while the later date was the last soybeans planted this growing season. The 92Y80 soybean seed is popular in this area and is a good fit for most soils in northern Illinois. The 93Y82 is a later season soybean and is generally not grown this far north. The results were typically what would be expected. The soybeans with the late planting date showed no significant difference as expected. The growing conditions were fairly dry and the seed was able to germinate and get out of the ground quickly. The seed treatment on the early soybeans was very beneficial because of the cold, wet conditions that came about right after planting. It showed a 4 bushel increase in the 92Y80s.

Soybean Varieties

Acres - 3.15 Planting Date - May 17th Harvest Date - October 13th

Soybean variety plot at Joliet Junior College.

Summary

There were 34 entries in the soybean variety plot with an average yield of 61.7 bu/ac. There was a 19 bushel range with yield ranging from 49.5 to 68.5 bu/ac. The Pioneer 92Y80 variety was used as a control in this plot. It is one of Pioneer's most popular soybean and is well rounded choice for seed production. In its 5 entries across the plot, it averaged 64.3 just slightly above the average of the entire plot. The lowest yielding cultivar was the Pioneer 92Y18. Two different varieties had the highest yields, Asgrow 2532 and DSR 2880. These soybeans were planted May 17th at a rate of 150,000 seeds per acre in 30 inch rows. Just before planting, the soil was lightly disked and post-emerge application of Showdown was used for weed control.

Results

Variety	Yield	Relative Yield
	Bu/ Acre	%
DSR 2727	59.8	97%
Asgrow 2330	59.0	96%
Sun Prairie 28R20	62.2	101%
Pioneer 92Y18	49.5	80%
NK S34-N3	62.0	100%
Stone 2R3001	64.2	104%
Pioneer 92Y80	60.9	99%
Asgrow 3131	61.9	100%
DSR 2995	60.6	98%
Pioneer 92Y53	56.5	92%
NK S25-T8	57.6	93%
Asgrow 2531	58.1	94%
Stone 2R 2801	68.5	111%
Pioneer 92Y80	66.6	108%
NK S25-R3	66.6	108%
Pioneer 92Y91	60.1	97%
Asgrow 2931	68.5	111%
DSR 2880	68.5	111%
Pioneer 92Y74	64.1	104%
Asgrow 2532	61.1	99%
Pioneer 92Y80	67.9	110%
NK S29-W7	66.2	107%
Pioneer 92Y50	65.5	106%
Asgrow 2731	59.4	96%
Sun Prairie 31R29	62.8	102%
Pioneer 92Y75	59.8	97%
NK S28-K1	53.7	87%
Pioneer 92Y80	59.6	97%
Stone 2R2701	57.5	93%
NK S27-C4	58.5	95%
Pioneer 93Y15	63.5	103%
DSR 2560	60.4	98%
Asgrow 3231	63.1	102%
Pioneer 92Y80	66.2	107%