Joliet Junior College

J.F. Richards Land Laboratory

Demonstration & Research Guide

2010

JOLIET JUNIOR COLLEGE
1901

Table of Contents

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 2010 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, Jeff Wessel and myself, 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 Jeff Wessel. Jeff has been the farm manager at Joliet Junior College since 2000 and has put forth much work and dedicated his time to care for and manage the J.F. Richards Land Lab. I would also like to thank Andy Rousonelous for his assistance to the farm this summer and also for combining the crop and gathering the yield data this fall. A special thanks to Lynda Scerine who retired this year and has been the secretary of the department for 15 years. Also, 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.

This is a list of contributors and companies that have donated their time and resources to the Joliet Junior College Demonstration and Research Farm in 2010.

Last	First	Organization
Bleuer	Bob	
Cronin	John	
Gill	Mike	Dekalb
Henninger	Adam	U of I
Higgins	Russ	U of I
Jankowski	Bob	USDA-NRCS
Lagger	Scott	Elburn Coop
Michlig	Michael	Pioneer
Myers	Dave	Monsanto
Porter	Rich	AMVAC
Rink	Nate	Burrus
Rousonelous	Andy	Joliet Junior College
Ruepert	Mike	Pioneer
Skonetski	Bill	Dairyland Seed
Smart	Will	Pioneer
Spencer	Joe	U of I
Thomas	Dave	Syngenta
Thumma	Todd	Garst
Walz	Wayne	Pioneer
Woodhall	Kent	Rosens

J.F. Richards Land Lab

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

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.

The Demonstration and Research Farm consists of 94 acres with 70 being corn and 24 being soybeans in 2010. Studies on corn this year included rootworm management, fertility studies, planting date, tillage studies, herbicide studies and the effect of sulfur on corn. Studies on soybeans this year included compaction, aphid resistance and soybeans cyst nematode resistance. There was also both a corn hybrid and soybean variety plot included on the farm.

Joliet Junior College

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

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.

Brad Angus	Agronomy/Business
Jim Ethridge	Greenhouse
Doug Foss	Mechanics
Caryn Genes	Horticulture Lab Manager/Greenhouse Manager
Dale Hummel	Animal Science
Bill Johnson	Agriculture Economics/Marketing
Scott Keller	Veterinary Technology
Mark Kuster	Landscape Design
Karen Magno	Veterinary Technology Secretary
Eileen McKee	Veterinary Technology
Frederic Miller	Nursery Management
Tammy Miller	Soils/Fertilizers/Agriculture Business
Roxanne Olson	Veterinary Technology
Lisa Perkins	Turf Management
Donna Theimer	Floral Design/Interior Plantscaping/Dept. Chair
Mike Szydlo	Farm Manager
Diane Vlna	Department Secretary

Tillage By Planting Date

Acres - 6.67 Planting Date - April 15th, April 29th, May 10th Harvest Date - October 20th

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

Treatments

- **Previous Crop**

  Corn

- **Hybrid**

  Burrus 5R68 HXX

- **Insecticides**

  None

- **Tillage**

  No-till, Disk, Chisel

- **Herbicides**

  Pre-emerge - Harness X-tra (43 oz.) 2, 4-D (16 oz.)

  Post-emerge - Roundup WM (21 oz.)

Results

	Tillage System		
Planting Date	Zero	Disc	Chisel
	Yield (bu/acre)		
Early	159	162	150
Normal	155	159	151
Late	156	166	158

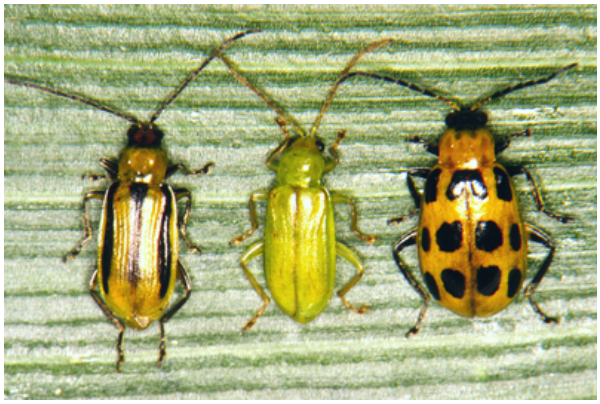
Summary

There was no significant variation between the three planting dates and three tillage systems. The later planted corn generally yielded slightly higher except in the zero-till system, where it was only 3 bushels less than the earliest planting date. The data also shows that when planting early, a deeper tillage system may not be advantageous to yield. This plot demonstrates that over the three types of tillage systems, the heaviest tillage system had the most impact on decreasing yield in an early planting situation. When looking at the three types of tillage systems, the system that included a disking in the fall followed by a shallow spring tillage operation yielded the highest of the three. In this study, the late corn planting yielded the highest, however, all three planting dates only had a 5 bushel range between them.

Corn Rootworm Control

Acres - 4.05 Planting Date - April 22nd Harvest Date - October 20th

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



Treatments

- **Previous Crop**
  - Corn
- **Hybrid**
  - Pioneer 33W80 (granular and control)
  - Pioneer 33W84 HXX/RR (HXRW)
  - Dekalb 59-64 (VT3)
- **Insecticides**
  - Force & SmartChoice
- **Tillage**
  - Fall Chisel, Spring Disk
- **Herbicides**
  - Pre-emerge - Harness X-tra (43 oz.)
  - Post-emerge - Impact (0.75 oz.)

Results

Treatment	Yield (bu/acre)
Untreated	155
SmartChoice (SC)	162
Force	168
HXRW	162
VT3	181
VT3 + SC	180
HXRW + SC	159

Summary

The yield results gathered from the data were generally expected except for a few outliers. The untreated control method was the lowest yielding at 155 bushels per acre. Both methods that used only granular insecticide showed results higher than the control; however, Force seemed to handle the insect pressure better and yielded 6 bushel higher than SmartChoice. The HXRW hybrid yielded the same as the method in which only Force was used. The hybrid with VT3 genetics significantly out yielded both granular insecticides and the HXRW genetics. Although one may think that combining hybrid genetics with the granular insecticides would provide an additional yield boost, this did not happen in this case. The HXRW actually yielded 3 bushels less when combining both technologies while the VT3 hybrid was almost identical when used with SmartChoice insecticide.

Corn Nitrogen Rate

Acres - 2.75 Planting Date - April 14th Harvest Date - October 17th

Applying the proper amounts of nitrogen to a corn crop will maximize yield.

Treatments

- **Previous Crop**

  Soybeans

- **Hybrid**

  Dekalb 61-69

- **Insecticides**

  None

- **Tillage**

  Fall Chisel, Spring Disk

- **Herbicides**

  Pre-emerge - Harness X-tra (43 oz.) 2, 4-D (16 oz.)

  Post-emerge - Roundup WM (21 oz.)

Results

Level of Nitrogen	Yield (bu/acre)
0 lbs.	129
40 lbs.	166
80 lbs.	189
120 lbs.	208
160 lbs.	211
200 lbs.	235

Summary

Applying the proper amount of nitrogen on a corn crop is essential to maximize the potential yield. In this study, six different nitrogen rates, 0 to 200 pounds were used in 40 pound increments, to demonstrate the effect that nitrogen rate would have on corn yield. This study was replicated 4 times and the results were averaged and shown above. The results were as expected and show that increasing nitrogen will have a positive effect on yield. The average difference between the yield variations was 21 bushels, with the highest difference being 37 bushels and the lowest being only 3 bushels.

Corn Herbicide Timing

Acres - 2.52 Planting Date - April 14th Harvest Date - October 17th

Proper herbicide timing on a corn crop will help to maximize yield.

Treatments

- **Previous Crop**

  Soybeans

- **Hybrid**

  Dekalb 61-69

- **Insecticides**

  None

- **Tillage**

  None

- **Herbicides**

  Pre-emerge - Harness X-tra (43 oz.) 2, 4-D (16 oz.)

  Post-emerge - Various timings of Roundup WM

Results

Herbicide Timing	Yield (bu/acre)
No Herbicide	193
V2	203
V4	216
V6	216
V8	211
V2 and V8	222

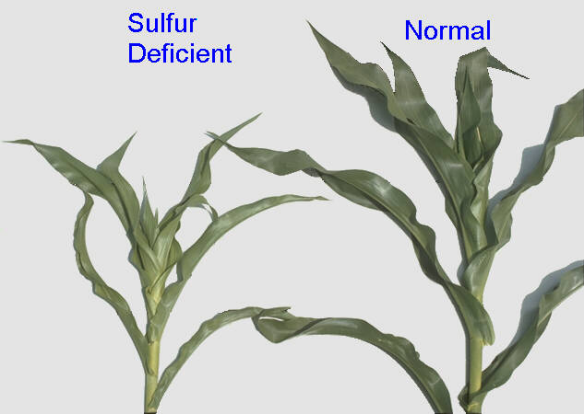
Summary

Herbicide timing on a corn crop can be critical to help control weeds that may cause problems on a corn plant during critical stages of development. In this study, the herbicide Roundup was applied at five different times to see the effect it had on corn yield. A control study with no application was also included. This study was replicated 3 times and the results were averaged and shown above. The data shows that applying a herbicide too early or too late can have a negative affect on yield. If only using one application, it is best to apply from V4 to V6. The biggest yield bump is seen when applying herbicide both early and later in plant development in order to control more than one flush of weeds that may affect corn plant development.

Sulfur on Corn

Acres - 1.76 Planting Date - April 19th Harvest Date - October 28th

Sulfur deficiency in a soil where a corn crop is planted will affect nitrogen uptake.



Treatments

- **Previous Crop**

  Corn

- **Hybrid**

  Pioneer P0916XR

- **Insecticides**

  None

- **Tillage**

  None

- **Herbicides**

  Pre-emerge - Harness X-tra (43 oz.) 2, 4-D (16 oz.)

Results

	Yield (bu/acre)
Control (No sulfur)	172
Sulfur	175

Summary

Sulfur is essential to help a corn plant photo-synthesize and also mobilize nitrogen. There-fore, it can have an effect on corn yield if soil levels are deficient. In this study, sulfur was applied to a corn crop to see what affect it will have on corn yield. Our source of sulfur in this study was A.M.S. (21-0-0-24) The treatment group was side-dressed with 30 pounds of sul-fur per acre. The control treatments were side -dressed with the same amount of nitrogen with no sulfur. The sulfur was applied on May 5th when the corn plant was at VE. This treat-ment was replicated 4 times. The results showed that the corn treated with sulfur had a 3 bushel increase over the corn that had no sulfur applied to it.

Continuous Corn Practices

Acres - 6.17 Planting Date - April 18th Harvest Date - October 18th

Strip tillage is a minimum tillage system that also includes the soil drying and warming benefits of conventional tillage.

Treatments

- **Previous Crop**

  Corn

- **Hybrid**

  Garst 85E98 3000GT

- **Insecticides**

  None

- **Tillage**

  Strip or Chisel

- **Herbicides**

  Pre-emerge - Harness X-tra (43 oz.) 2, 4-D (16 oz.) Roundup WM (11 oz.)

  Post-emerge - Roundup WM (21 oz.)

Summary

This study is a split plot design that is looking at a variety of factors that affect corn yield. The first thing 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 examined to see what effect it may have upon yield. In the study, either 160 or 200 units of nitrogen was applied during the growing season. Within each nitrogen application, 40 units of nitrogen was applied as starter fertilizer and also not applied as a control. When looking at the study as a whole, the chiseled plots out yielded the field that were strip tilled by 9 bushels. As expected in both tillage systems, the extra nitrogen had a slight yield increase over the plots with only 160 units applied. In this study, the effect of starter fertilizer was little to none. When the tillage system and total nitrogen applied was compared in conjunction with the use of starter fertilizer, no significant difference was seen. All of the results of using starter fertilizer or applying all of the nitrogen at one time were within 2 bushels of one another.

Soil Fertility

Acres - 5.88 Planting Date - April 22nd Harvest Date - October 19th

Understanding the importance of soil fertility is key to maximizing crop production.

Treatments

- **Previous Crop**

  1/2 Corn, 1/2 Soybeans

- **Hybrid**

  Dairyland Seed 92080 HXX/RR

- **Insecticides**

  None

- **Tillage**

  Corn stalks - chiseled

  Soybeans - No-Till

- **Herbicides**

  Pre-emerge - Harness X-tra (43 oz.) 2, 4-D (16 oz.)

  Post-emerge - Roundup WM (21 oz.)

Results

Fertility	Yield (bu/acre)
Normal	146
Basic	161
Acidic	165
No P	157
No K	156
No P & K	159

Summary

It is important to understand the importance of soil fertility and how it may affect grain yield. In this study, we are attempting to show how various levels of soil fertility will affect grain yield. This study was first implemented in Fall of 2001. The results of this year's study are not generally what would be expected. The normal results should show that normal fertility levels should out yield basic, acidic soils, along with soils lacking in P and K. This study will be replicated again next year and soil samples will be taken in the fall to determine exact soil nutrient levels and see how they vary from soil tests taken in the Fall of 2001 and 2005.

Corn Hybrids

Acres - 4.18 Planting Date - April 21st Harvest Date - October 21st

Treatments

- **Previous Crop**

  Soybeans

- **Tillage**

  No-Till

Summary

The average grain yield of the 35 entries in our corn variety was 194 bushels per acre, which was the same average as our control variety. The control variety (CHK) used in this plot was Dekalb 61-69 and varied 9 bushels from one end of the plot to the other. Yields in the plot ranged from a low of 166 bushels per acre from Dairyland 9309Q, to a high of 224 bushels per acre with Dekalb 62-67, giving a yield range of 58 bushels per acre. The overall results of the plot were fairly uniform with no major outliers. The yield range varied no more than 15% of the average throughout the entire plot.

Results

Variety	Grain Yield	Relative Yield
	Bu/Acre	%
Dairyland 9313	194	100%
Dekalb 62-67	224	115%
Burrus 4J63	200	103%
Pioneer P0916XR	198	102%
Dekalb 61-69 CHK	194	100%
Dekalb 61-21	196	101%
Becks 5435 HXR	201	104%
Garst 86J49	168	87%
Burrus 2F16	178	92%
Dekalb 62-54	210	108%
Becks 5354 HXR	194	100%
Burrus 4E30	206	106%
Dairyland 6310	196	101%
Dekalb 61-69 CHK	195	101%
Dekalb 59-35	203	105%
Garst 84Y14	212	109%
Golden Harvest	175	90%
Burrus 5G45	203	105%
Becks 4413A3	179	92%
Dekalb 58-83	204	105%
Golden Harvest	196	101%
Garst 85E98	193	99%
Dekalb 61-69 CHK	184	95%
Dekalb 59-64	196	101%
Garst 84U58	188	97%
Dekalb 57-50	191	98%
Becks 5135 HXR	168	87%
Golden Harvest	189	97%
Garst 86T82	201	104%
Dekalb 55-09	190	98%
Dairyland 9309Q	166	86%
Dekalb 61-69 CHK	203	105%
Dairyland 9410	195	101%
Pioneer 33W80	204	105%
Pioneer 33W84	190	98%

Soybean Aphid Resistance

Acres - 1.6 Planting Date - April 14th Harvest Date - October 12th

The soybean aphid is a relatively new pest to soybeans in North America.

Treatments

- **Previous Crop**

  Corn

- **Hybrid**

  NK - F 25-S2 (aphid resistant)

  NK - S 25-R3 (control)

- **Tillage**

  None

Results

	Yield (bu/acre)
Untreated	62
Treated	56

Summary

The emergence of soybean aphids is a relatively new problem to soybeans in the Midwest. We are still learning about them and their life cycles. They were not as big of a pest to soybean fields in 2010 as they have been in previous years. Aphids did not tend to show up until late in the growing season. In this study, two types of soybeans were planted, one that was aphid resistant and one that was not. They were planted side-by-side and replicated 4 times. The yield results were averaged and displayed above. The results are inconclusive. One would think that a variety that is aphid resistant would out yield a variety that is not resistant, however, there was not enough aphid pressure during the growing season to see the full capabilities of a resistant variety.

Nematode Resistance & Foliar Pesticides

Acres - 3.23 Planting Date - April 30th Harvest Date - October 14th

Pesticides are often applied to soybeans to control insects.

Treatments

- **Previous Crop**

  Corn

- **Hybrid**

  Pioneer soybean seeds with various levels of SCN resistance

- **Tillage**

  None

- **Herbicides**

  Roundup WM (21 oz./acre)

- **Foliar Pesticide**

  Quadris and Warrior applied at R3

Results

Variety	Pesticide	Yield (bu/acre)
Susceptible	No	64
	Yes	63
88788	No	59
	Yes	57
88788+	No	65
	Yes	64
Peking	No	65
	Yes	64

Summary

This plot was designed as a split plot arrangement. Eight different treatments were used and replicated four times. Four types of soybeans were used, a variety susceptible to SCN, a variety with type 0 resistance (88788), a variety with type 2 resistance (88788+), and an unlabeled Peking variety. The second part of the plot involved a pesticide application on all four of them and also an untreated control. The results show that the variety with no resistance yielded less than the others and the variety with type 2 resistance along with the Peking were identical. All of the varieties were actually harmed slightly by the pesticide applications which may be due to the fact that there was little insect pressure on soybeans this year and an application may have stunted a soybean crop that was healthy and needed no pesticide application.

Compaction in Soybeans

Acres - 1.96 Planting Date - April 19th Harvest Date - October 12th

Soil compaction will affect crop growth and development.

Treatments

- **Previous Crop**

  Corn

- **Herbicides**

  Pre-emerge - Harness X-tra (43 oz.) 2, 4-D (16 oz.)

- **Tillage**

  None

Results

	Yield (bu/acre)
Compacted	51
Not Compacted	52

Summary

As farm machinery get larger and heavier, soil compaction becomes more of an important issue to look at everyday. In this study, our MXU 115 and 3 point side-dress unit full of water was used to compact the soil in our study. The study was replicated three times and the results were averaged. The compacted soil showed a 1 bushel per acre yield reduction over the non-compacted soil as expected. Keys to reducing compaction include: avoid unnecessary field traffic, avoid tillage of wet soils, use wider tires or tracks, and be sure that tires are inflated to the minimum requirements.

Soybean Varieties

Acres - 2.53 Planting Date - May 4th Harvest Date - October 9th

Soybean variety plot at Joliet Junior College.

Treatments

- **Previous Crop**

  Corn

- **Tillage**

  No-Till

- **Herbicides**

  Roundup WM (21 oz./acre)

Results

Variety	Yield	Relative Yield
	Bu/ Acre	%
NK F25-S2	47	94%
DSR 2930	48	96%
Pioneer 92Y80	48	96%
NK S34-R2	49	98%
Pioneer 93M11 CHK	47	94%
Burrus 28J0	44	88%
NK S25-R3	44	88%
Burrus	50	100%
Pioneer 92M54	50	100%
Burrus 32KO	50	100%
DSR 2929	48	96%
NK S29-W7	48	96%
Asgrow 3130	48	96%
Pioneer 93M11 CHK	48	96%
Asgrow 2830	48	96%
Pioneer 92Y53 (PK)	45	90%
DSR 2770	46	92%
DSR 3017	43	86%
Pioneer 93M11 CHK	50	100%
Asgrow 2931	50	100%
Asgrow 3030	55	110%
Asgrow 3101	52	104%
Pioneer 93M11 CHK	57	114%

Summary

There were 23 entries in the plot with an average yield of 48 bushels per acre. Yields varied from 43 to 57 bushels per acre. The control variety used in this plot was Pioneer 93M11 that also happened to represent the highest yielding of the group with 57 bushels per acre. The lowest yielding cultivar was the DSR 3017 that yielded 43 bushels per acre giving this variety plot a range of 14 bushels per acre.