2021
Center For Excellence

Agriculture Field Plot Research

TABLE OF CONTENTS

FORWARD

The 2021 season was the 25th birthday of the Center for Excellence for providing plot work, data, keynote speakers, great dinners and many memories for local and regional growers and agribusinesses. Weather has definitely been the major influence in plot work establishment and performance that we at the Center have faced for years.

After a couple of wet years, the 2021 season started off with great anticipation. The spring started with reasonably dry and favorable temperatures. Farmers went into action and planted a lot of corn and soybeans in April-May. There was hope that after 18 months, some level of normalcy had come to Lenawee County. Mother nature didn't disappoint us, rains in June through early July caused issues with making hay, and in some areas caused crops to be planted late.

Timely, but scattered, rains continued through the summer and produced crop yields that were great in some areas and more average in parts of the region that became dry.

The Center for Excellence was up and running again and we had a good crowd though not our largest, potentially a result of remaining Covid fears. The Peterson Brothers were our featured speakers/entertainment and we were able to draw in some younger farmers because of this.

This years harvest started with corn silage being chopped in early September and then mother nature again reasserted control. It started raining, and the next couple of months would bring rainfall of over eleven inches. It became a real challenge to get wheat planted, resulting in only 25-50% of the normal wheat acres being planted. Many producers went after their corn crop due to diseases –primarily tarspot- that were causing ear drop and the corn stalks to lodge make it a slow and difficult harvest.

There were many corn fields that were harvested in December and into January 2022, making it a long season.

Covid-19 showed its ugly head again in December 2021 and raised havoc with our planned Crops day set for January 7, 2022. Fortunately, the Crops Day event took place and it was a great success! A good crowd of 110 participants enjoyed an all day event that featured Bob Utterback giving producers buying and trading tips via his home in Florida brought to us through Zoom. It worked out great!

The Center for Excellence will be making it's run for thirty years of programming. To all our loyal participants, stick with us and see this through! It should be great run.

Thomas Van Wagner

Center for Excellence

Last Word for 2021

Tim and Angela Stutzman
Raymond and Stutzman Farms

We say this every year 2021 what a ride! It was a year of great crops, and great prices. We started out April, May, and half of June dry ample moisture to get crop up and growing. End of June it started raining it seemed like it rained all the time for a month, some of it excessive. It was a challenge to make hay as well harvesting the wheat crop! Some areas were hurt in poorly drained areas of fields. September came, it got dry again. Corn silage harvest started Labor Day due to tar spot in the corn. The tar spot was literally killing the corn plant and, we could not chop corn fast enough! End of September it started raining again, making bean and corn harvest a challenge, as well as primary tillage. For the first time in my life we never got our wheat crop planted! All and all, 2021 was a decent year. I would take the weather pattern it showed us again. My only change would be not so much rain in the fall. So I end 2021 with a very full heart personally, looking forward to 2022!

Blaine Baker of Bakerlads Farm

I am not a believer in global warming but I do admit that the weather patterns have changed. The rain storms that we received are of greater amounts and of higher intensity than rain events of 15 years ago. After the rain storms, many times it becomes dry, too dry at times. This causing our operation to look at the planting methods that we are using.

As a believer in no-till and cover crops, I like the concept of planting green. We have a planter that can do this. We have the chemistry to kill and control the weeds. The thing we can't do, is control the weather. After two years we have found that the extremes of the weather is making the cover crop too hardy, robbing much needed moisture for the planted corn or soybean crop when the dry periods come.

So you live and learn. We are going to continue to no-till and use cover crops. We may plant green but I can promise you the cover will be sprayed early before we plant into it.

2021 FARM PARTNERS & SPONSORS

Center for Excellence

Partners

Lenawee Conservation District

Bakerlads Farm

Raymond and Stutzman Farms

Michigan Soybean Promotion Committee

Sponsors

Andre Land Forming, Advanced Drainage Systems, Calhoun County Farm Bureau, Consumers Energy, Farmer-Led Watershed Conservation/Erb Family Foundation, Fulton Soil & Water Conservation District, Gleaner Life Insurance Society, GreenStone Farm Credit Services, Haviland Drainage Products, Hillsdale County Farm Bureau, Kemner-Iott Benz & Auto Owners Insurance, Lenawee County Farm Bureau, LG Seeds, McMunn Brothers, LLC, Michigan Agricultural Commodities, Inc., Michigan Soybean Promotion Committee, Michigan Wheat Program, Monroe County Farm Bureau, Nutrien Ag Solution, Paul Martin & Sons, Precision Ag Services, Inc., PT Consultants, River Raisin Watershed Council, The Andersons, Inc., Triple K Irrigation, USDA-FSA & NRCS Michigan

Additional Support

Ag Leader, Michigan State University, M&R Investment, MAEAP, Paul Prielipp, Green Field Ag, Pioneer Hi-Bred, Prattville Fertilizer & Grain Inc, Scott Cover Crops, MI Dept. of Agriculture & Rural Development, Lennard Ag Co., Sieler's Water Systems, Spring Party Store

MSPC

Kemner Iott Benz
We Know Insurance. You Know Us. Let's Talk.

Auto-Owners INSURANCE
LIFE • HOME • CAR • BUSINESS

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4DS

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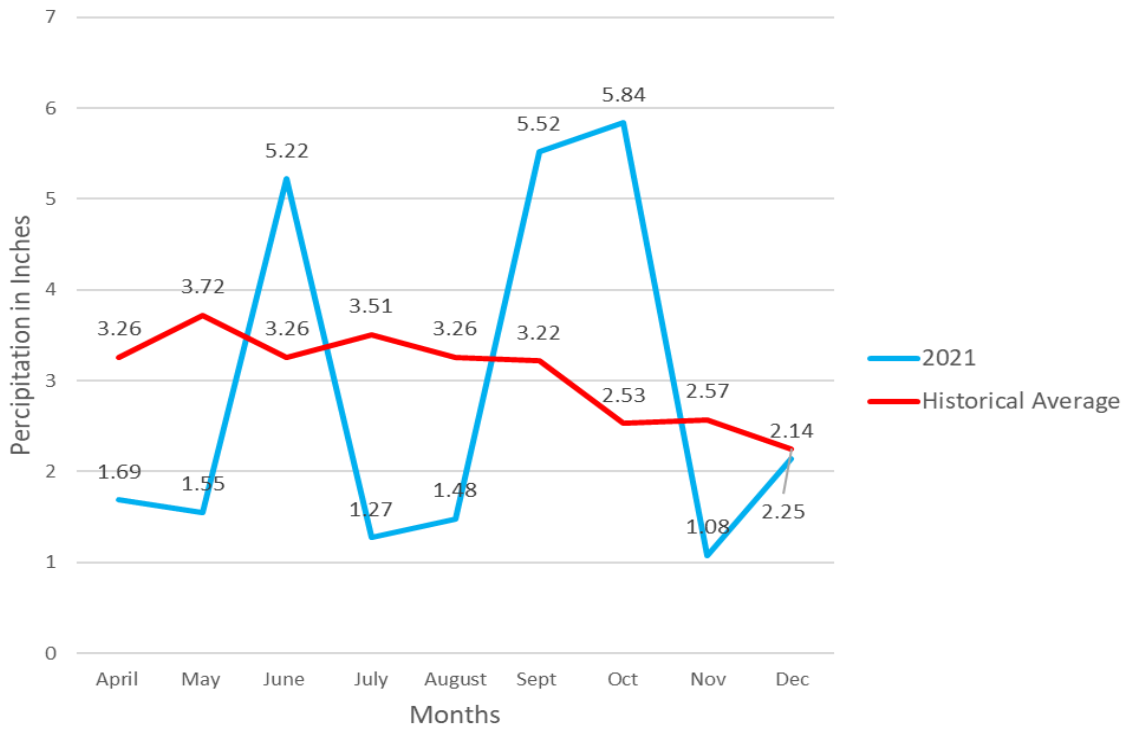
2021 RainFall Data

Bakerlads Farm



2021 Soybean Tillage Trials
Bakerlads Farm

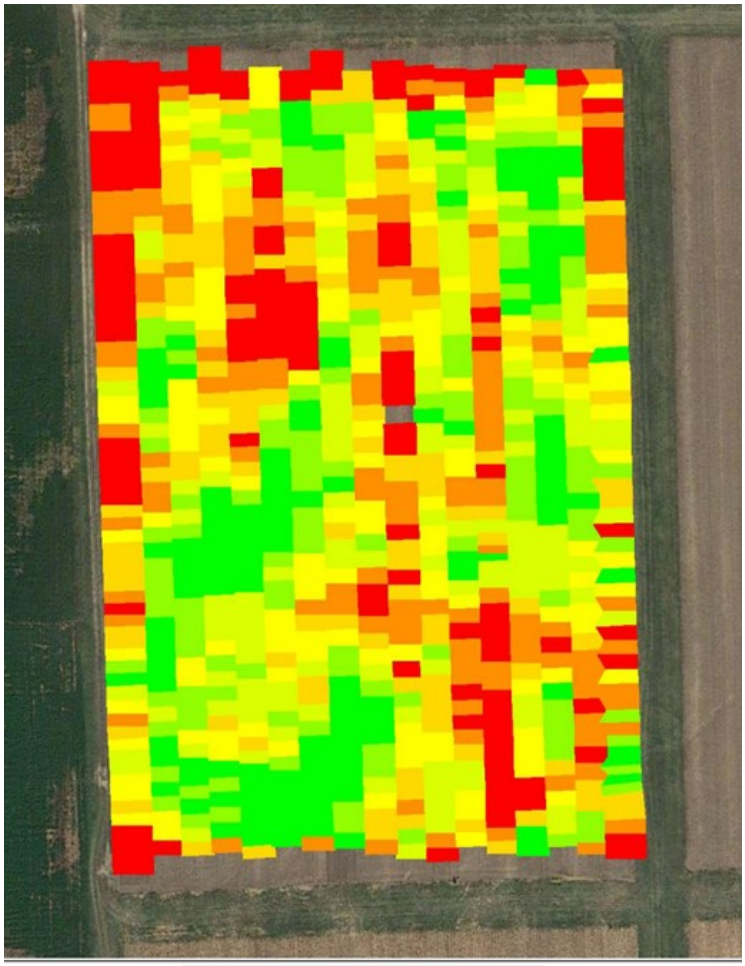
2021 Soybean Tillage Trials
Bakerlads Farm

OBJECTIVES

In 1996 the Center for Excellence was created by a committee of local farmers to evaluate approved tillage systems on highly erodible land for corn and soybean production. This was the 25th year of tillage trials at the Bakerlads farm.

The tillage treatments have changed throughout the decades, evaluating different types of strip-tillage tools, soil amendments for tillage (gypsum), field cultivators, and vertical tillage tools. The planter technology coupled with RTK control systems have improved the ability to plant with better precision when field conditions are challenging.

Individual strips of yield data
Note: Green is high yield, Red is lower yield



METHODS

PLANTING DATE: 5-25-2021

POPULATION: 120,000 SEEDS/AC

VARIETY: PIONEER P26T57E

The replicated tillage plots have been reduced to just four system for 2021: No-till Strip Till, Fall Disk ripping/spring high speed disk and Spring high speed disk . Each treatment in replicated four times through the field. All plots were seeded with annual ryegrass mix cover crop in September 2020.

The plots are planted the same day at a normal planting date that is dictated by local weather. The strips are currently 30 feet wide. Data was collected using a combine that has been calibrated with harvest data recorded by each pass of the combine. Strips or parts of a strip that are compromised by weather are eliminated or adjusted for strip size.

2021 Soybean Tillage Trials
Bakerlads Farm

Yield Results

The data listed below shows a significant yield difference based on just the tillage system used.

The no-till soybeans had a mean average of 42.4 bu/acre and the data was statistically significant higher yield compared to the fall disk ripping and spring high speed disk. The strip-till mean average was 40.7 bu/acre and was not statistically higher yielding than both the fall and spring tillage plots.

The no-till and strip-till get assigned the letter a, while the strip-till gets assigned an additional letter b denoting it's yield was statistically the same as the spring and fall tillage which both get the letter b.

Tillage Systems	Strip Till Bu/ac	No till Bu/ac	Fall Disk Ripping Bu/ac	Spring High Speed Disk Bu/ac
1	41.8	41.0	40.7	39.5
2	37.9	41.3	38.3	37.5
3	42.9	43.4	39.4	40.1
4	40.1	43.6	36.4	39.0
Mean Average	**40.7 ab**	**42.4 a**	**38.7 b**	**39.0 b**

Statistics: P<.05; CV 4.13; LSD 2.56 No-till: statistically higher yield than fall disk ripping and spring high speed disk. Strip-till statistically the same yield as the fall disk ripping and spring high speed disk

2021 Soybean Tillage Trials
Bakerlads Farm

ECONOMIC RESULTS

From the data above it can be observed that the yield data is quite tight, with a 3.7 bu/acre mean yield difference among all of the tillage systems. It should be noted that the net return after tillage and planting was determined using 2021 custom rate value chart. Essentially there is very little yield difference regardless of the tillage system used.

The savings is primarily found in the labor and servicing debt on equipment to do tillage operations above and beyond the no-till planting system. The increase cost from doing fall tillage: 57.72/acre , strip-till: $41.32/acre and $37.53/ac for spring tillage when compared to a no-till system. The no-till had the highest return to management after tillage and planting of $498.23/acre compared to the Fall tillage system of $416.36/acre, a difference of an additional $81.87/acre.

Soybean Tillage System	Mean Yield bu/ac	Net Return After Tillage & Planting Based on mean average
Strip-Till System (auto-steer, planting and strip-tilling) $41.32/ac	40.7	**$457.26**
No-Till System(no-till planting with auto steer) $21.17/acre	42.4	**$498.23**
Disk-Ripping System (disk-ripping, one pass high speed disk with leveling, planting with auto steer) $57.72/ac	38.7	**$416.36**
Spring High Speed disk (one pass in the spring, Planting with auto steer) $37.53/ac	39.0	**$440.22**
Rates based on 2021 Custom Machine and Work Rate Estimates	Soybean value based on 2021 fall delivery rates $12.25/bu	

2021 Foliar Fungicide and Fertilizer Applied at R1 Stage of Soybeans

Center for Excellence

Objective

Evaluate the value of an application of a fungicide when tank mixed with a foliar fertilizer as compared to no fungicide and fertilizer application.

Analyze the cost of the application and return on the investment from this practice

Methods

In 2021, replicated plots were done with spraying a fungicide and foliar feed mix at the soybean R1 reproductive stage of the plant. This is early flower bloom. This was compared to no application.

A 120 foot spray boom was used to apply the produce with a forty foot harvest table.

Two harvest strips per plot were used for the four replicated samples in each of the foliar application and non application.

Veltyma™
Fungicide

†For disease control and plant health in beans and peas, citrus, corn, peanut, potato, rapeseed (canola), specified small grains, sorghum, soybean, and sugar beet

†See **Detailed Use Directions** for detailed crop listings.

+

ENC
ELE-MAX NUTRIENT CONCENTRATE

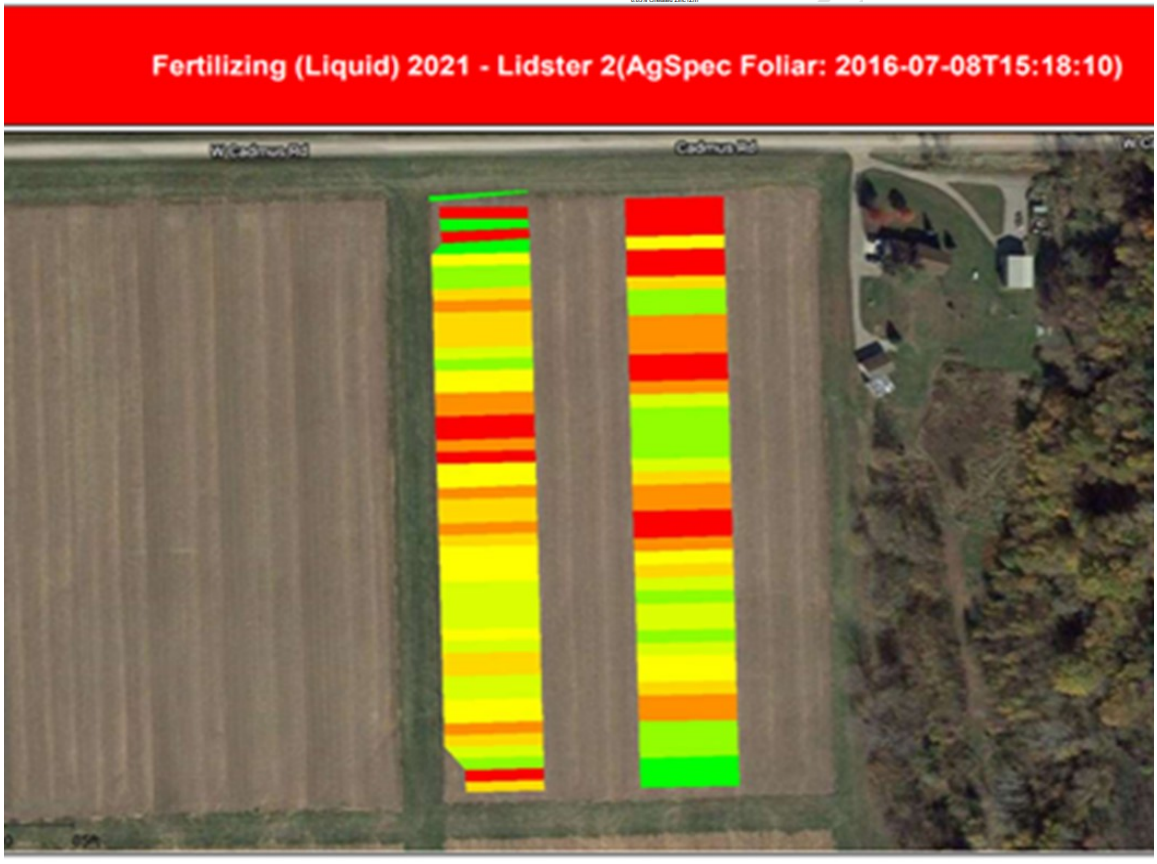
AN INORGANIC LIQUID NUTRIENT FOR FOLIAR FEEDING OF PLANTS

11-8-5

GUARANTEED ANALYSIS

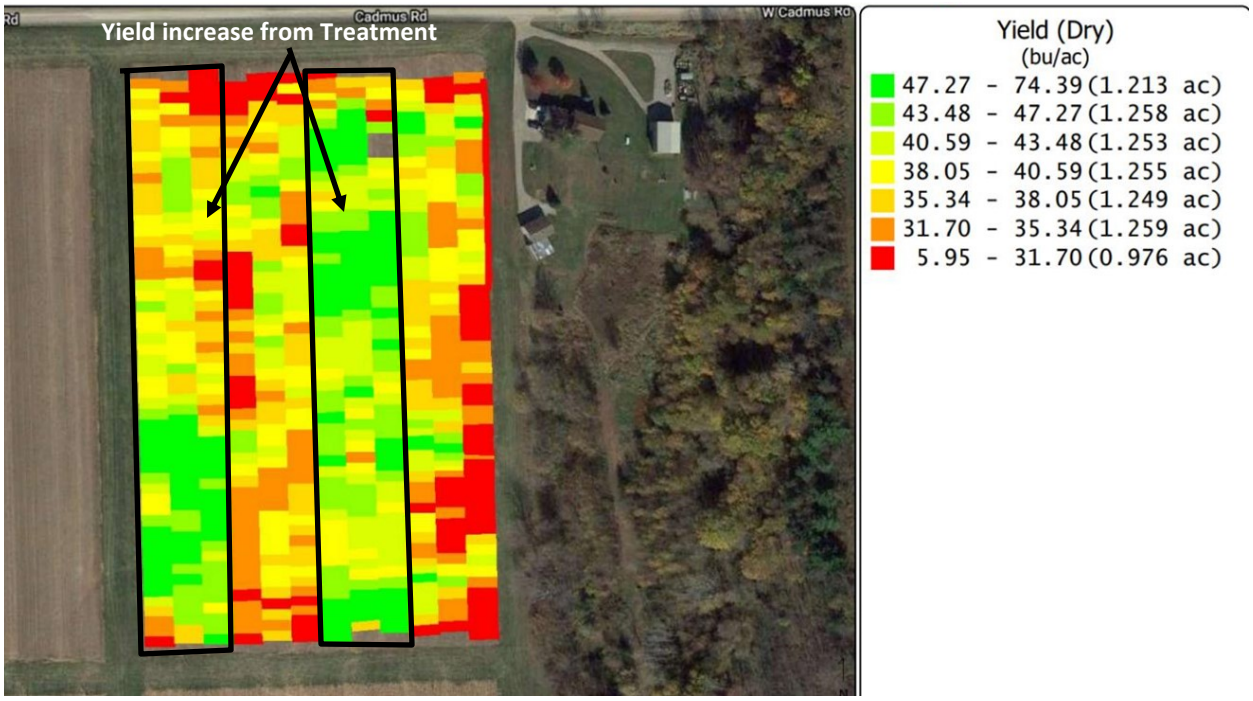
Total Nitrogen (N) 11.00%
2.40% Ammoniacal Nitrogen
8.60% Urea Nitrogen
Available Phosphate (P_2O_5) 8.00%
Soluble Potash (K_2O) 5.00%
Boron (B) 0.02%
Cobalt (Co) 0.0005%
Copper (Cu) 0.05%
0.05% Chelated Copper (Cu)
Iron (Fe) 0.10%
0.10% Chelated Iron (Fe)
Manganese (Mn) 0.05%
0.05% Chelated Manganese (Mn)
Molybdenum (Mo) 0.0005%
Zinc (Zn) 0.05%
0.05% Chelated Zinc (Zn)

7 oz /acre of Veltyma + 2 Qts per acre of ENC



2021 Foliar Fungicide and Fertilizer Applied at R1 Stage of Soybeans

Yield Map



Veltyma Fungicide Plus ECN Nutrient Concentrate 11-6-5 with Secondary and Micronutrients

Yield and Return on Investment

Yield Samples bu/ac	1	2	3	4	Mean bu/ac	Gross Income	Cost $/ac	Net Income Per acre
Foliar Application	41.7	44.9	43.3	42.8	43.2	529.20	$34	$495.2
No Application	38.8	34.7	36.6	40.5	37.7	461.83	$0/Ac	$461.83
Statistics P<.05 CV 5.1 LSD 3.5	Use Soybean Value of $12.25/bu.				+ 5.5 bushel Significant			+$33.37

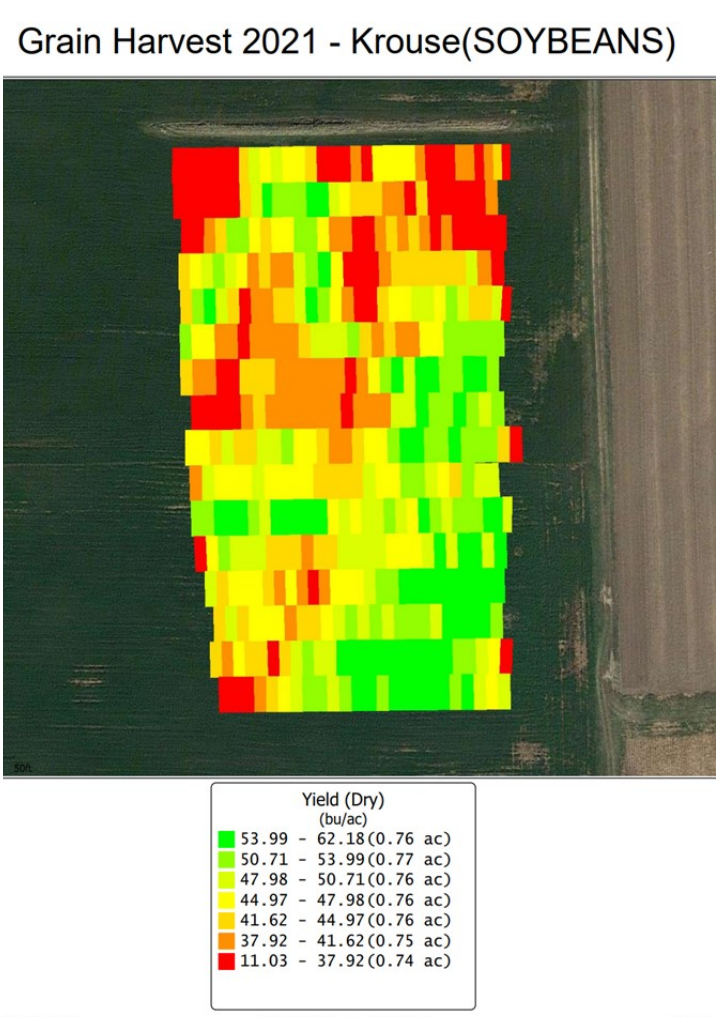
2021 Soybean Population Trials
Bakerlads Farm

Objective

The population study is in its third year at the Bakerlad Farms. The increased cost of soybean seed with all of the technology that the product provides, has brought higher input costs for cash grain farmers. The planter technology has provided farmers new technology to improve singulation and emergence for corn and soybean crops. The precision planting process which could include hydraulic down pressure on individual rows, electric drives, and seed firmers has a cost that goes with it. Could the new planter technology pay for itself over a period of time through increased yields plus the reduction of inputs to obtain competitive yields?

Using planter technology, improved varieties along with good soil health practices allow producers to reduce planting populations as part of a high yielding production system.

Methods



Planted: seeds/ac	Emergence: plants/ac
120,000	98,000
150,000	138,000
60,000	48,000
90,000	78,000

The seeding populations were replicated four times randomly across the field. Seeding populations were record by the In-Command display and an emergence count was completed when it was well into the vegetative stage just prior to the reproduction stage.

A new corn planter was used with 15 inch splitter units to plant the crop. The previous crop was corn and it was no-tilled. The new planter lacked row-cleaners, and hydraulic down pressure for 2021

The harvest data was collected with a calibrated yield monitor.

2021 Soybean Population Trials
Bakerlads Farm

Results

The results from the 2021 replicated populations studies are interesting to observe. The soybeans were planted at a normal planting time for the area using a pioneer variety. No fertilizer was applied and a cover crop of annual rye-grass, rape and clover mix were established in the fall of 2020. The crop in 2020 was corn followed by soybeans in 2021 as part of the alternating corn and soybean rotation.

Observations for the 2021 soybean crop were as follows.

The weed control in the plot was very good. The yields in the field increased as the individual replicated plots went from top to bottom. The soil changes from an eroded phase of a morley silty clay loam to a non-erosive blount/pewamo soil that was not lacking organic matter. The side by side replications sorted out the variability in the field from soil type and not the population. The lower populations of 60,000 plants per acre seeded was statistically the same as the higher populations seeded. When observing the soybeans in the early vegetative stage, the soybeans that were lower population didn't look near as good as the higher populations. It had been very dry for a few weeks and the soybeans were lacking moisture and the plants showed it. As the summer went on timely rainfall provided much needed soil moisture to improve the character of the field. As can be seen by the chart below there was only a couple bushel yield difference. The return to investment on using less seed was much higher than the 120 and 150 thousand seed drop.

Seed Drop/acre	120,000	150,000	60,000	90,000
Emergence plants/ acre	97,500	138,000	48,000	72,500
Mean Average bu/ acre	47.7	47.2	49.5	47.8
Cost per acre for seed	$58.4	$73.00	$29.2	$43.8
Return to Mgt. after seed costs $12.25/bu	$525.92	$502.84	$577.125	$541.75
Statistical Data P<.05 CV 9.59 LSD: 7.10 No significant yield difference				

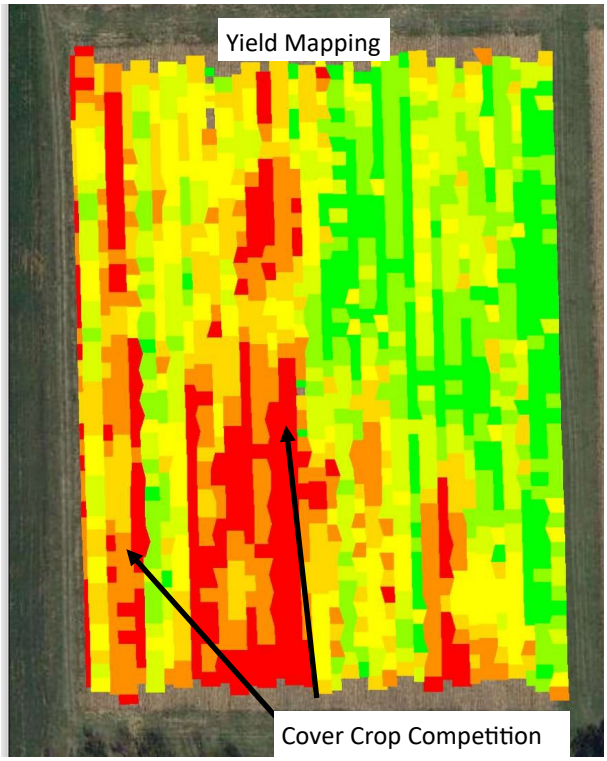
2021 Corn Tillage Trials
Bakerlads Farm

Center for Excellence

2021 Corn Tillage Trials
Bakerlads Farm

OBJECTIVES

In 1996 The Center for Excellence was created by a committee of local farmers to evaluate approved tillage systems on highly erodible land for corn and soybean production. This was the 25th year of tillage trials at the Bakerlads farm. No-tilling or strip-tilling corn has always been a challenge for producers, but with technology such as hydraulic down pressure, electric drives, row cleaners, RTK autosteer has allowed no-tillers to obtain improved consistency in germination performance. Poor singulation and emergence can cause a yield lag in years where wet or dry weather patterns can agronomically challenge the crop. The Center for Excellence is dedicated to keeping the replicated tillage plots in place due to the challenges of controlling erosion and the water quality issues in the Lake Erie Basin.



METHODS

PLANTING DATE: MAY 25, 2021

POPULATION: 26,500

VARIETY: P26T57E

The replicated tillage plots have been reduced to just four systems for 2021: No-till, Strip Till, Fall Disk ripping/spring high speed disk and Spring high speed disk. Each treatment in replicated four times through the field. All plots were seeded with annual ryegrass mix cover crop in September 2020. The plots are planted the same day at a normal planting date that is dictated by local weather. The strips are 30 feet wide and the center eight rows are sampled for the replicated plot data. The combine was calibrated for harvest data recorded by each pass of the combine.

RESULTS

The green areas are represented with yields ranging from 157 ->200 bu./acre corn while the red areas in the indicate yields from 56-84 bu./acre.

The 2021 spring planting season was complicated this year. The season started off dryer than normal from April through mid may resulting in crops being planted fairly early. In early June, rainfall was above average. This put limitations on getting crops sprayed with herbicides and getting nitrogen side-dressed at a normal time. Cover crops were outcompeting germinated crops and could not be sprayed in a timely manner to get them under control without some damage to the existing crop. The wet season turned into several weeks of dry weather which further hurt a small corn crop that was competing for moisture from a live cover crop. With time, the crop finally took off but was stressed compared to the plots that were tilled and had no cover crop that was growing. The lower yielding areas are dominated by no-till and strip-till where cover crop competition was the most prevalent.

2021 Corn Tillage Trials
Bakerlads Farm

Results

The 2021 yield data with the replicated strips statistically gives the Fall Disk Ripping a significant yield advantage over all of the other tillage systems as indicated by the data listed below. The other tillage systems no-till, strip till and spring high speed disk were not significantly different in yield. In the past 25 years, yield data has demonstrated that regardless of tillage system there was no significant yield advantage for doing tillage in a corn and soybean rotation.

In 2021, the yield advantage went to the system that eliminated early competition for emergence and seedling vigor. The cover crop competition, reduced yield on no-till , strip-till and one pass spring disking. The cover crop on the fall disk ripping was minimal do to the fall tillage and was eliminated with the spring secondary tillage.

2021 Replicated Data Result

Tillage Systems	Strip Till Bu/ac	No till Bu/ac	Fall Disk Ripping Bu/ac	Spring High Speed Disk Bu/ac
1	114.0	115.6	139.6	88.9
2	116.1	109.7	146.2	111.0
3	122.8	134.7	159.7	137.6
Mean Average	**117.6 b**	**120.0 b**	**145.5 a**	**112.5 b**

Statistics: Fall disk ripping significant over all other tillage systems. The other three systems were not different in yield. P< 0.05 CV 12.92 LSD 25.47 Note: yield data highlighted in yellow were hurt by cover crop competition.

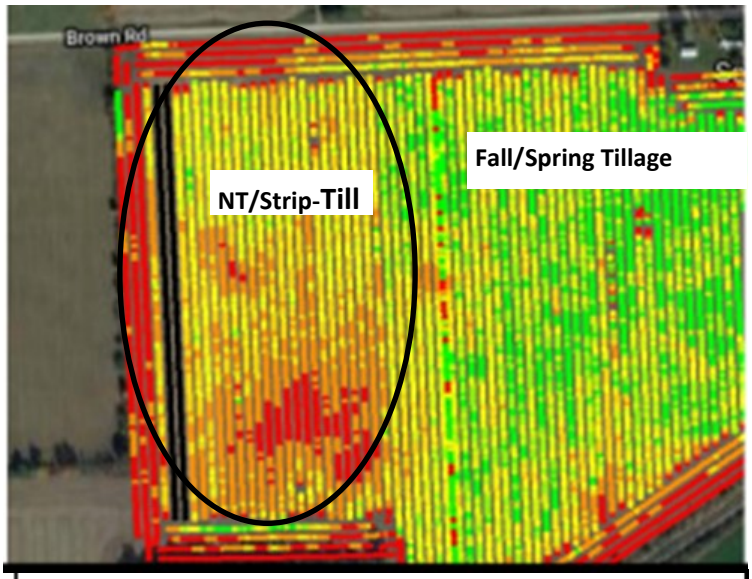
Economic Results

The mean yield data for each one of the tillage systems was used to determine the net return to management after tillage and planting. The Disk ripping system had a significantly higher yield compared to the other tillage systems. This was primarily due to the fall tillage followed by spring secondary tillage which eliminated any cover crop that was in the strips. The other strips battled cover crop competition due to the inability to kill it due to wetness in the field. When it became very dry the cover crops zapped most of the soil moisture before the herbicide program eliminated the cover crop.

Corn Tillage System	Mean Yield bu/ac	Net Return After Tillage & Planting Based on mean average
Strip-Till System (auto-steer, planting and strip-tilling) $41.32/ac	117.6	**$558.44**
No-Till System(no-till planting with auto steer) $21.17/acre	120.0	**$590.83**
Disk-Ripping System (disk-ripping, one pass high speed disk with leveling, planting with auto steer) $57.72/ac	148.5	**$699.63**
Spring High Speed disk (one pass in the spring, Planting with auto steer) $37.53/ac	112.5	**$536.22**
Rates based on 2021 Custom Machine and Work Rate Estimates		Corn value based on 2021 fall delivery rates $5.10/bu

2021 Corn: No-till verses Strip-Till
Raymond and Stutzman Farms

2021 Yield Map



Description	Average	Total	Minimum	Maximum
Yield (Dry)	199.72 bu/ac	364.81 bu	147.69 bu/ac	235.97 bu/ac
Moisture	18.83 %		17.13 %	20.94 %
Elevation	809.28 ft		806.89 ft	811.64 ft

Objective

Compare a no-till verses a strip-till corn tillage system in a 2nd year corn crop at the field level.

Method

An 8 row strip-tiller was used and alternating strips of 24 rows of no-till compared to 24 rows of strip-till and twelve row head was used to harvest individual samples.

The no-till/strip till plots are located in the highlighted oval area. The area of the trial are located in a lower yielding part of the field as indicated by the red/orange and yellow areas . The green color represents higher yields.

The no-till/strip-till plot work was planted into last years cornstalks The red areas on the lower part of the map are wet areas and due to the excessive rainfall some-times it results in lower yields due to drainage issues.

The balance of the field was vertical tilled in the fall and in the spring of 2021 secondary tillage performed prior to planting. It appears, to the row, where tillage started as compared to the no-till and strip-till the yield map is dominated by increased yields.

It is unfortunate the alternating strips of no-till verses strip were not continued across the entire field.

The project design will be again implemented in 2022.

2021 Corn: No-till verses Strip-Till
Raymond and Stutzman Farms

Yield Results

The yield results for the two tillage systems have been tabulated. There were five replications compared to develop the statistical analysis of the yield data. There very little yield difference in the two systems for yield. The less than two bushel yield difference was not significant.

Although the yields were not different the part of the field which was vertical tilled had a yield average of over two hundred bushel/acre and there appeared to be a significant yield difference. Although the yield was significantly higher it should be noted that the best part of the field as indicated by the yield map was on the fall and spring tillage systems.

Tillage Systems Replications	No Till Bu/ac	Strip Till Bu/ac
1	199.72	198.45
2	193.53	194.69
3	190.42	186.92
4	181.03	183.81
5	185.63	178.77
Mean Average	190.1	188.5
Statistics: P<0.05 CV 4.02 LSD 11.10 No significant difference in yield due to tillage systems.		

Economic Results

The economic analysis between the two systems was set-up to compare the net return after tillage and planting based on the mean yield average measured. The 2021 Michigan State University custom rate sheet was used in the cost analysis. The price of $5.10/bushel was used per the average price for fall delivery.

As indicated in the chart, there was a $28.31 advantage to the no-till due to the extra cost of the stip-tiller and the machinery to pull it.

Corn Tillage System	Mean Yield bu/ac	Net Return After Tillage & Planting Based on mean average
Strip-Till System (auto-steer, planting and strip-tilling) $41.32/ac	188.5	**$920.03**
No-Till System(no-till planting with auto steer) $21.17/acre	190.1	**$948.34**
Rates based on 2021 Custom Machine and Work Rate Estimates		**Corn value based on 2021 fall delivery rates $5.10/bu**

2022 Center for Excellence Plot Work

Corn and Soybean Trials

- Strip-Till
- No-till
- Disk Ripping
- High Speed Disk and or Soil finisher
- Phosphorus reduction Strategy (lower critical level to 10 ppm)

Corn Trials

- Pop-Fertilizer compared to no pop-up
- Revisit OptRx sensor nitrogen management
- 15-inch corn silage verses 30 inch
- Fungicide Treatment

Soybean Trials

- Population Studies (singulation)
- Fungicide/Foliar feed at R1(2nd year)
- Row spacing: 30 inch verses 15 inch
- No-till verses strip-till
- Pop-Fertilizer compared to no pop-up

SAVE THE DATE!

2022 FIELD DAY

WEDNESDAY, AUGUST 10TH, 2020

Center for Excellence Survey

Please fill out this survey and send it to the Lenawee Conservation District at:

1100 Sutton Rd. Adrian, MI 49221 or to lenaweecd@macd.org

Your feedback is greatly appreciated!

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1. **The Center for Excellence is starting its 26th season. Would you like to see the Summer Field Day continue?**
   ☐ Yes ☐ No
2. **The corresponding event to the Summer Field Day is our January Crops Day: Would you like to see this program continue?**
   ☐ Yes ☐ No
3. **Would you like to see the format of the Summer programs change? Please select all that apply.**
   ☐ Time of year ☐ Length of program ☐ no changes needed _____ Other: ☐

_____

4. **What type of presentations/plot work/ trials would you like to see in the future?**
   ☐ Technology ☐ Equipment Demonstrators ☐ High powered Key note speakers
   ☐ Soil health ☐ Tillage Plots ☐ Cover crop plots ☐ Planting dates ☐ Population
   ☐ Varieties ☐ Singulation ☐ Row spacing ☐ Fertilizer plots ☐ Conservation demonstration plots ☐ Fungicides ☐ Insecticides ☐ Organic ☐ Combine calibration
   ☐ Sprayer Calibration

5. **Would you like to see the format of the Winter Crops Day Change?**
   ☐ Location ☐ Program length ☐ Time of year ☐ No Changes Necessary
   ☐ New Speaker topics? ☐ Keynote speaker, please list speaker ideas_____

6. **Do you feel you are getting the most out of your time spent at both the Field Day and Crops Day?**
   ☐ Yes ☐ No

Check out more about the Lenawee Conservation District and Center for Excellence on our website and Facebook Page.

https://lenaweeconservationdistrict.org/

https://www.facebook.com/lenaweeconservationdistrict

LENAWEE CONSERVATION DISTRICT