FINAL REPORT
LEPF Grant - ~~10-06~~ 01-06
Due July 31, 2004

TITLE
Securing Quality Data Using Farmer Clusters and Summer Interns

Project Sponsor
Conservation Action Project
Multi County Coordinator - William Rohrs 75 Joliette Drive Napoleon, OH 43545
Authorizing Officer
Secretary/Treasurer – William Houtz 2320 Bowling Green Road, Bradner, OH 43406
Fiscal Agent
State Coordinator - Ed Crawford, Program Specialist, ODNR 952 Lima Avenue Findlay, OH 45840

Special Thanks
Special thanks are due to the agricultural agencies, agriculture related businesses and individuals who helped make this worthwhile effort succeed in providing quality data that would be shared throughout the agricultural industry.

Lake Erie Protection Fund
Generous support from the Ohio Lake Erie Commission through the Lake Erie Protection Fund made the concept of sharing equipment and information through farmer conducted field demonstrations possible.

Local Agricultural Dealers
The following local dealers assisted in securing farmers for the program and in providing valuable information regarding fertility practices used on the farms,
Davis Farms Services, Liberty Center, Ohio - Tom Badenhop Manager
Edon Farmers Cooperative, Edon, Ohio - John Hug Manager
Gerald Grain Center, Ridgeville Corners, Ohio - Chris Bonner Manager
Paul Martin & Sons Equipment, Gerald, Ohio - Paul Martin Owner

Cooperating Farmers
The following farmers conducted demonstrations, provided field and yield data used to evaluate the demonstrations and the data generated: Mike Benecke, Napoleon; Roger Bennett, Edon; Larry Bischoff, Gerald; Randy Coles, Edon; Ron Cordes, Ridgeville Corners; Tony Disbro, Edon; Dan Durham, Napoleon; Kevin Homan, Napoleon; Dan Meyer, Okolona; Art Michaelis, Defiance; Garry Oberlin, Edon; Brent Osborn, Edon; Robin Rettig, Napoleon; Richard Vorwerk, Napoleon; Mark Watchman, Okolona and Larry Wendt, Ridgeville Corners.

Summer Intern Field Scouts
The CAP field scout program demonstrated the importance of scouting fields to detect conditions that effect yield. We appreciate the excellent work done by these college students: Ryan Bergman, Josh Gerwin & Tiffany Roemke.

Consultants
Agricultural consultants provided services, advice and knowledge to farmer clients and to CAP.
Nester Ag Management, Joe Nester, Owner
Agronomy First Consulting Services, Tim Barney, Certified Crop Consultant

OSU Extension and SWCD conducted field demonstrations and held excellent educational field days & meetings.
OSU Extension, Soil and Water Conservation Districts

Cover Page

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The Conservation Action Project (CAP) Organization
CAP has an active 28 member, volunteer Board of Trustees represented by farmers, local suppliers, agricultural agencies, agricultural consultants, equipment dealers and major agricultural companies in Defiance, Fulton, Henry, Lucas, Paulding, Williams and Wood Counties. These counties border or drain directly into the Maumee River en route to Lake Erie. This group plans and directs a comprehensive program of conservation tillage activities.

The Main Objective of CAP - Meeting Lake Erie Phosphorus Reduction Goals
CAP began in 1988 with the main objective of increasing the acres of conservation tillage as a means of reducing phosphorus loss from fields into Lake Erie. The phosphorus reduction goals set between Canada and the US were met in CAP counties by 1992. Emphasis was given to maintaining this phosphorus reduction level and increasing the level achieved if possible, plus addressing the concern of nitrogen entering public water systems.

Addressing The Threat To Achieved Soil and Nutrient Loss Reduction Goals
By 1997, a marked decrease in conservation-tilled corn acres was noticed. To eliminate the threat to achieved soil and nutrient loss reduction goals, CAP has since concentrated on tools and techniques that remove dense soil layering and manage heavy residue, two causes of slow plant growth and reduced yield.

Reduced Conservation Tillage, A State Wide Problem
While no-tilled soybean acreage has steadily increased in nearly all regions of the nation, corn under both no-till and conservation tillage has decreased. The state level of conservation tilled corn acreage was below the 1994 level. Counties bordering and draining into the Maumee River and consequently in Lake Erie, experienced the same trend. At one time, levels in NW Ohio averaged 60-70% conservation tilled acreage, but no-till and conservation tilled acres were now below the level reached by 1997.

Identifying Environmental Problems
Meeting Lake Erie water quality concerns rests on the success farmers have dealing with wet soils when spring plantings need to be made. That this high level was once obtained suggests that it can again be done, can be maintained, and the potential exists to exceed past levels by using new technology and practices.

The Causes Of Reduced Conservation Tillage Acres In NW Ohio
The inherent cause of soil loss in NW Ohio is that 80% of the cropland is in row crop corn & soybeans. This presents a high soil loss situation. The high percentage clay lakebed soils in the Maumee River Watershed present problems to farmers, problems associated with a layer of crop residue causing soils to remain cold and wet. Attaining yields that meet the costs of production is directly associated to early planting. In the challenge to create dry, warm soils and recapture lost production, farmers have reverted to tillage that is often below the 30% conservation tillage standard.

The Use Of Conventional Tillage Tools
Farmers use conventional tillage tools to remove residue from the soil surface by mixing the soil and residue or by incorporating the residue deep into the soil. Farmers attempting to make timely (early) corn and soybean plantings often began planting before the soil was dry. Travel in fields before the soils can withstand the weight of planting equipment adds to soil density. Compaction has been a major factor in conservation tilled corn yields being reduced 20 bushels per acre.

Addressing Sudden Soil Density Change
The first step needed in the process to return conservation tillage to previous high levels is removing dense layers present in the soil. Operating sub tillage tools at the depth of present layering removes the layers and allows roots to penetrate the soil past these layers. This allows rainfall to infiltrate the soil and allow farmers to plant earlier without having to mechanically remove residue from the soil surface.

Keep Soil Layering From Recurring

The second step is using newly designed residue management equipment (Brand Names: AerWay, DMI Nutriplacr, Dynadrive, Dynamaster, Krause Land Saver, McFarlane, Phillips Rotary Harrow, Progressive, Remlinger, To The Max) to mix the residue with the top inch of soil. These tools permit soils to dry more quickly in the spring. These tools when used properly remove dense soil layering and keep them from recurring. Fall strip tillage tools that remove residue where the row of crop is planted were also demonstrated. These tools permit soils to dry on the row to be planted from two days to one week earlier.

Damage To The Soil Structure

In fields where tillage had again taken place, soil penetrometer tests showed dense layers at 4 inches, the depth where shallow tillage tools like disk harrows were operated; at 7 inches where chisel plows and v-rippers were run and at 10-12 inches where moldboard plows once reached. Tillage can in one pass, remove any benefit conservation tillage and no-tillage had to soil structure.

Damage To The Environment

The environment is damaged when soils exposed to rainfall are dislodged and become a part of the surface water leaving fields and getting into ditches, streams, rivers and the lake. Soils in the region with 30% or more residue cover undergo little if any soil erosion regardless of the amount or severity of rainfall. Conservation tillage was instrumental in the rapid achievement of phosphorus reductions goals set by Canada and the US. The present challenge was to put resources toward again achieving and surpassing these goals. Newly developed residue management tools were used that help dry the soil earlier in the spring. Tools that keep soil layering from recurring and spatial technology that allows accurate gathering and evaluation of field information helps achieve, maintain and surpass the goals set.

Past Efforts To Reverse the Trend To Tillage

Since 1998, CAP has conducted conservation tillage demonstrations with 49 farmers equipped with global positioning and yield monitors, a total of 980 acres; 6 soil and water districts equipped with residue management tools, a total of 560 acres; and 3 local agricultural dealerships equipped with strip tillage tools, a total of 320 acres.

Implementing Lake Erie Protection and Restoration Plan Practices To Solve The Problem

- Increase the percentage of agricultural acreage in the Lake Erie watershed under conservation tillage practices; PL - 3 of the Lake Erie Protection & Restoration Plan
- Implement soil conservation practices and research into new conservation practices research; PL- 6 of the Lake Erie Protection & Restoration Plan
- Implement precision fertilizer applications and other best management technologies; Pl - 7 of the Lake Erie Protection & Restoration Plan

FARM CLUSTERS

A New Approach To Improve Lake Erie Water Quality

To achieve success, the following work was planned:

- Organize seven clusters of seven farmers sharing equipment and plot information
- Help each farmer plan and conduct demonstrations that produce quality information
- Help each farmer use global positioning and yield monitors correctly and accurately
- Train the farmers to locate and identify areas of yield difference
- Help each farmer identify the cause of yield differences so proper treatment is made.
- Hire two field scouts to work with the farmer groups involved in the program
- Assist with planning and conducting educational meetings and field days

Involving Farmer Clusters To Increase Conservation Tillage Acres

The purpose of forming farm clusters was to encourage farmers to join efforts in sharing equipment and information from demonstration conducted. To expand the efforts to increase the acreage of conservation tillage and the number of farmers working on the problem, CAP was successful in forming five local clusters of farmers in Defiance, Fulton, Henry, and Williams Counties. The result of efforts by these groups helped other farmers determine how to solve similar problems. The volume of information this group produced combined with that of ongoing CAP efforts, enabled farmers to better decide on conservation tillage cultural practices beneficial to the environment and to the farming economy.

Success In Broadening The Base Of Information With Organized Groups Of Farmers

Farmer groups added 18 farms conducting conservation tillage demonstrations and an additional 1000 acres of nitrogen rate, sub tillage, strip tillage and residue management demonstrations to the number conducted by other efforts. These four cultural practices were selected on the basis that they play a significant role in improving public water quality by changing rates of nitrogen application, time of year when nitrogen is applied and providing residue cover to the soil, protecting it from the erosive effects of wind and water. Improving the use and increasing the acreage of these practices will result in extended long-term adoption of conservation tillage.

Organized Groups Gain Economical and Environmental Benefit

To conduct these demonstrations, it was necessary for farmers to use equipment costing up to $40,000, putting them out of reach of some farmers. Since these tools cover many acres in little time, they sit idle most of the year. Sharing tools and data permits farmers to select tools that improve the environment and the agricultural economy.

Compensating Farms For Conducting Demonstrations

Each group was offered $7,000 to aid in the acquisition of equipment and putting out plots. Farmers in the group furnished quality plot data for three years. As a result of increasing the number of farmers providing information, additional farmers are aware and have access to information that can help them reduce tillage.

Utilizing Proper Plot Design To Obtain Quality Field Data

Replicating and randomizing cultural practice comparisons within a demonstration assures that each comparison is treated fairly and evenly throughout the field. All of the variations existing within the field are present in each practice being demonstrated. Farmers followed a suggested randomized, replicated plot layout designed respectively for nitrogen rates, sub tillage, strip tillage and residue management.

See Illustrations 1-3.

Using Summer Interns To Scout Field Demonstrations

A field-scouting program was initiated the summer of 2001 so all fields could be monitored beginning with plot layout to gather information pertinent to yield. The Board hired two summer interns in 2002 to monitor 50 demonstrations during the growing season when contact with the farmer is the most needed, and one scout to monitor 18 demonstrations in 2003.

The Field Scouting Procedure

Scouts visited each plot conducted by farmers in the county groups five times to evaluate plot layout, record crop germination and crop emergence, monitor plant growth, weed, insect and disease pressure; observe operator omissions and commissions; make compaction tests; do tissue sampling; collect weather and yield data; present weekly reports to dealers, farmers and to CAP. Each scout drove approximately 3000 miles each summer conducting this activity. This assistance provided information during the growing season when many of the variables occur that affect yield.

Eliminating Field Variables By Reporting All Field Information
A first item of business was to carefully check each field so all inputs were accounted for in the yield report. Unreported information hides the true cause of yield differences. Even when randomized replicated plot guidelines were followed, the past six years of conducting demonstrations has shown that information coming from farm demonstrations is frequently not quality data.

Using Global Positioning and Yield Monitoring Equipment Properly
All farm cluster farms had combine yield monitors; nearly all used global positioning. Combining global positioning with yield monitors allowed data maps to be made and yield differences precisely marked. Thus, specific application and attention was given to both increased and reduced yield difference areas in the field.

Yield monitors record information as frequently as once every second or every 6.6 feet of forward travel at 4.5 miles per hour. Global positioning pinpoints areas in the field within one meter. This permits yield differences to be obtained and treatment to be changed to fit field conditions as often as application equipment will allow. Prior to precision agriculture technology, yields were obtained using weigh wagons measuring one harvest round or the capacity of the weigh wagon, often over .5 acres, thus the flaw in determining accurate, representative yield was never realized.

Using Global Positioning and Yield Monitor Data
Past use of global positioning and yield monitoring showed that while yield averages were very accurate, high and low yielding areas were not reported accurately. Many yield monitors are not calibrated to record both high and low yields. This is a common occurrence. With poor quality data, the ability to assess the performance of a practice and choose wisely on this basis is not possible. A need was seen to determine the true cause of yield differences.

Implementing A Program To Address Yield Monitor Data Problems
Wide use of global positioning and yield monitors is only 4-6 years old, so there is much to learn about this new technology. Too little expertise exists in the industry regarding the operation of this equipment in the field and standards vary between companies. This adds to the complexity of obtaining uniform, accurate yield data.

To ease the situation, global positioning and yield monitor training meetings were offered to farmers in the groups. A program of reading individual farmer's maps and analyzing data was incorporated. This raised the percentage of usable yield data from 25% - 80% and above. Farm cluster farmers can now select practices on yield results.

The Difficulty In Generating Quality Farm Field Data
Farmers with little computer experience have more than the normal amount of difficulty in operating this technology. While this technology can depict yield differences and pin point the exact spot of difference, more work was needed to understand the potential and limitations of the technology.

Major yield differences occurred when machines failed or operator omissions were not recorded. Weather, product availability and other factors can cause farmers to change practices within a plot. The integrity of the information is compromised when these changes are not noted. The potential of precision agriculture technology to minimize the environmental concerns of modern farming practices is nearly unlimited. However, learning to use this technology is more difficult than any farming practice attempted to this time.

Using Field Mapping To Detect Field Variations
Analysis of field maps shows variations in soil type, weed, insect and disease pressure, equipment failure, operator error and improper yield monitor calibration. These affect yield and destroy data quality. Up to 75% of farm plots do not produce the data quality that can be expected from the technology.

Accomplishing Farmer Cluster Project Goals

Five Farm Clusters were formed in September 2001 to conduct field demonstrations for two years using conservation tillage equipment that would protect the soil surface with 30% or more year round crop residue. Cost of equipment and the addition of application features by the time the project began raised the cost from $20,000 to nearly $40,000. Consequently, only five clusters were formed.

Sharing Strip Tillage And Residue Management Equipment

During the two years, twenty-six demonstrations were conducted sharing five conservation tillage tools; the DMI Nutriplacr, the Progressive and the Remlinger strip tillage tools; the JD 550 Mulch Master and AerWay residue management tools. All of the tools used worked according to residue management projections and are welcome additions to conservation tillage tools. Sharing tools and information was made possible by the grant.

Using Quality Data To Determine Beneficial Conservation Tillage Cultural Practices

Broadening the base of accurate, usable farmer data in the project drew attention to those cultural practices that produce the desired results of reducing nitrogen loss, removing compaction layers and managing residue so that compacted layers do not recur. It also pointed out equipment and practices that did not produce desired results and should be discontinued. For the first time, it is possible for farm size fields to approach the accuracy of the small size plots conducted at research centers. Making this common on farms will do much to enhance the adoption of practices beneficial to both the environment and the farm economy.

Reducing Nitrogen Loss

One of the most critical public water supply problems is the presence of nitrates that leave fields and areas where nitrogen is in surplus and gets in streams, rivers and into lakes. An ongoing project of demonstrating nitrogen fertilizer rates, starter fertilizers and time of application was conducted. Reducing nitrogen rates and changing the time of application helps eliminate the need for municipalities to issue nitrate alerts. It also meets current high nitrogen price and nitrogen availability needs. The village of Napoleon issued the first nitrate alert of the year on May 20, 2001. Other municipalities using water from the Maumee River had issued nitrate alerts.

Accomplishing The Strategic Actions To The Lake Erie Protection Plan

Adding five Farmer Clusters in Defiance, Fulton, Henry and Williams Counties to the 49 GPS/Yield Monitor units, the 32 deep tillage demonstrations and 8 residue management demonstrations in progress, enhanced efforts to halt the trend to tillage. Getting additional information on techniques and methods to reduce compaction, manage residue and eliminate compaction from recurring to farmers both large and small, is an important step in increasing the acres of conservation tillage. Adding this information to present CAP efforts will help increase conservation tillage acres and remove the potential threat of again having Lake Erie severely polluted.

Activities and Timeline of Activities

	Activity	Timeline
1.	Formed Five Farmer Clusters	9/01
2.	Determined and designed demonstrations to be conducted	9/01
3.	Select two summer interns to conduct field evaluations	4/02 & 4/03
4.	Began field inspections	6/02
5.	Conducted fall strip tillage	9-12/02-12/03
6.	Conducted soil compaction, weed control tests	6/02-9/03
7.	Harvested plots, make yield comparisons	9-12/02-12/03
8.	Conducted 1 field day, 3 clinics, 6 presentations, 3 special meetings	1/02-12/03
9.	Collected and analyzed data from two harvest seasons	9/01-12/03
10.	Summarized and published final report	7/04

Collaborating With Agencies And Individuals
The following persons were contacted and were involved in the project:

- FEDERAL - NRCS - James Rickenberg, Water Quality Specialist 419-352-5172 technical ass't.
- STATE - ODNR - Edward Crawford, Program Specialist 419-424-5006 technical assistance
  - OSU Extension - Reza Ehsani, Precision Ag Specialist 614-292-2540 technical assistance
  - Matt Sullivan, Precision Ag Specialist 614-247-7876 technical assistance
- COUNTY - OSU Extension - Defiance, Fulton, Henry, Lucas, Paulding, Williams, Wood
  - Soil & Water Districts - Defiance, Fulton, Henry, Lucas, Paulding, Williams, Wood
- LOCAL - Wm Rohrs - County CAP Coordinator 419-592-9099 plot design/dealer & farm contact
  - Mark Riehl - Dow AgroSciences, 419-267-5559 plot, technical and field day support
  - Joe Nester - Crop Consultant, 419-658-8866 technical support, plot design, field map
  - John McGuire - Spatial Ag Systems 419-899-2376 interpret and analyze field data

Information Dissemination
The CAP Newsletter with a circulation of 2200 in Ohio, Indiana and Michigan has been the primary method of information dissemination. CAP newsletters containing Farm cluster information and equipment in the trials were published December 2001; April 2002; October 2002; Spring 2003 and Spring 2004.

Seven soil and water districts publish newsletters to 2300 or more constituents and a like amount are sent as OSU Extension newsletters. Both of these agencies are involved in CAP projects and articles were published regarding their involvement in CAP sponsored residue management equipment activity.

The CAP web page (capofohio.org) developed March 2000 to broaden the audience also carried this information.

The following educational events were held during Farmer Cluster Program:

- November 5, 2001 Farm Cluster meeting – demonstration plot information – 30 attended
- February 28, 2002 Paul Martin Open House – Nitrogen Report presentation
- June 6, 2002 Sponsor Yield Monitor Clinic @ Nester Ag Management – 27 attended
- June 20, 2002 Sponsor Yield Monitor Calibration Clinic, NW Branch OARDC - 64 attended
- August 19, 2003 Sponsor Williams SWCD Field Day – two sessions - 50 attended
- February 9, 2004 Sponsor GPS/YM meeting Wauseon - 24 attended
- March 5, 2004 Sponsor Yield Monitor Clinic Nester Ag Management - 27 attended

The following presentations were made on related topics during the Farmer Cluster Program:

- December 18, 2001 Sponsor Regional Agronomy meeting, Deshler - 250 people attended
- December 11, 2001 Ohio NoTill Council meeting presentation - 150 attended
- February 19, 2002 GPS Meeting – Nitrogen plot information - 24 attended
- June 21, 2002 BGSU presentation – high school teachers masters degree study – 27 attended
- December 18, 2002 Sponsor Regional Agronomy Day, Deshler – 64 attended
- January 7-10, 2004 National NoTill Conference presentation - 650 people

Publications:

- Publish 2002 FC Plot Book March 26, 2003 - 100 copies
- Publish 2002-2003 FC Plot Book January 6, 2004 – 100 copies
  - Included in this final report

Measuring Conservation Tillage Acreage Achieved
The success of efforts to increase conservation tillage acreage is determined bi-annually through transect surveys conducted by Soil and Water Districts. Regular stops on a set route are made where the crop and residue cover amount is noted on each side of the road. Over 300 stops are made providing an accurate measurement of the percentage of cropland with 0-15% residue cover, 15-30% cover and over 30% residue cover. This data is accepted as accurate and is widely used throughout the industry. The source of this information is The Conservation Technology Information Center (CTIC).

The Benefit Of Additional Conservation Tilled Acres To Lake Erie Easily Assessed
The ability of conservation tillage to reduce soil loss and phosphorus particles attached to the soil is well received. According to modeling uniformly accepted, each acre of cropland in the Maumee River Watershed protected by a 30% residue cover reduces soil loss and the resultant phosphorus attached to the clay particle by over 50%. More is saved if more cover is present.

A Massive Amount Of Quality Data Resulted From This Effort
Forty-nine farms assisted by CAP in purchasing global positioning system and yield monitors now provide information regarding the use of GPS/YM and four cultural practices; six Soil and Water Districts and two local agricultural dealerships are providing information regarding the use of residue management equipment. The inclusion of 1000 or more acres in the Farmer Cluster Program area doubled the effort by the amount of acres generating scientific, quality information.

The Maumee River Watershed Better Represented Geographically
When the new technology program was started, few farmers were interested in making the investment. Nearly all combines now sold have yield monitors installed. Global positioning lags this amount, but the numbers and skill in the use of yield monitors and global positioning is gaining.

The Most Benefit Is Obtained By Promoting Conservation Tillage Efforts In This Watershed
Although consisting of only 3% of the area draining into Lake Erie, it is reported that 37% of the sedimentation into Lake Erie comes from this watershed. Approximately 80% of the area's farmland is used to produce corn, soybeans and wheat. Most of the area consists of lakebed soils. Highly erodible land is prevalent only in Williams County.

CAP Has A Strong Record Of Accomplishment And An Ongoing Conservation Tillage Program.
With an ongoing program and low overhead, nearly 95% of the total costs will go toward programming, little toward administration. Efforts chosen by CAP are those deemed to have the best chance of increasing long-term conservation tillage. This has not been an easy task, but one by one, challenges have been met.

Conservation Action Project 2003 Farm Cluster Plot Data

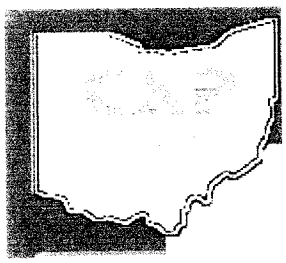
*** Includes 2002 Yield Data ***

Project Title:
"Securing Quality Data Using Farmer Clusters & Summer Interns"

Project Sponsor: Ohio Lake Erie Commission

Lake Erie Protection Fund

Grant Number: 01-06



Background: This booklet is a collection of all the yield data collected by the CAP program from its fifteen farm cluster members for the 2003 harvest year. The booklet also contains yield data from the 2002-cropping season, when there were nine members in the farm cluster program. The initial nine members have now completed their term with CAP in the farm cluster program, while the other six are signed on to provide one more year of data. Conservation farming practices are the main focus of the farm cluster program, and in 2003 there were 11 strip-till plots, 3 AerWay plots, 3 minimum-till plots using the JD Mulch Master, and 1 replicated Nitrogen plot. These plots test a new type of crop production method against the farmer's traditional practice, or fine-tune the new practice.

Thank you: CAP would like to thank the following farms and dealers for conducting these demonstration plots and all the information they have given us that is included in this report. Your time, effort, and resources are appreciated. CAP would also like to thank the Ohio Lake Erie Commission through the Lake Erie Protection Fund for making monies available for conducting these demonstrations the past two years.

Mark Wachtman	Rob Rettig	Dick Vorwerk
Larry Bischoff	Kevin Homan	Todd Hesterman
Larry Wendt	Mike Benecke	Art Michaelis
Ron Cordes	Dan Durham	Dan Meyer
Brent Osborn	Roger Bennett	Tony Disbro
Randy Coles	Jodi Osborn	Garry Oberlin

Tom Badenhop, Davis Farm Service, Liberty Center
Paul Martin & Sons, Gerald
Chris Bonner, Gerald Grain Center, Ridgeville Crnrs.
Jon Hug, Edon Farmers Coop, Edon

Purpose: The main objective of the CAP Farm Clusters program is to prove conservation crop production systems can yield equal to or better than conventional crop production systems, while providing better soil conservation and water quality. In order for this to be proved, years of repetitive data are needed and this is why some farm clusters are ending as new ones are starting. At the end of each harvest year, the yield data from these plots along with the general farm information are combined into a booklet to showcase the results and help farmers make the decision to choose conservation tillage.

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2003 Farm Cluster Plot Data

Farm Wachtman **County** Henry

Plot Type: S-B-S*, Strip-till (Wheat Stubble) vs. Stale Seedbed

Planting/Tillage Information:
Crop Corn Date Planted 4/23/03 Variety 1-6-35Y54 Pioneer
Seeding Rate 30,000 seeds/A Planter Used JD 1760
Planting depth 1.5 inches Year 2002 Crop Wheat
Acres in plot site .682A
Fall Tillage Chisel/worked, Strip-till
Spring Tillage none
Average Population: 30,500 Percent 100%
Emergences: ~100%

Fertility Program:
Fertilizer Applied: 200lbs, 0-0-60, 100lbs, 11-52-0, 10lbs, Zinc
Starter: 180lbs, 10-34-0
Side-dress and Type used: 165lbs, AA Total N
Applied: 153.5lbs actual

Herbicide/Insecticide Program:
Pre-emerge: 1qt, Princep; 1qt, Clearout (glyphosate)
Post-emerge: 3oz Hornet, 1qt, Atrex Insecticide
Applied: Lorsban

Harvest Data:
Date Harvested 10/30/03 Combine Used JD 9510
Yield Monitor Used Greenstar
Average Ear Count: 29.5/30 stalks
% Stalks w/ Ears: 98%

Rainfall Amounts and Dates: 16-June, (6.5/10 inch) 30-June, (4/10 inch) 10-July, (1&8/10 inches) 22-July, (8/10 inch) 6-Aug., (2&8/10 inches) 14-Aug., (3/10 inch)

YIELD DATA:

Practice	Yield	Moisture
Strip-till wheat Stubble	201.18 bpa	19.5%
Stale Seedbed	197.9 bpa	18.9%

* S-B-S denotes a Side-By-Side plot comparison.

Farm Wachtman County Henry
Plot Type SBS, Strip-till Wheat Stubble vs. Strip-till Soybean Stubble

Planting/Tillage Information:
Crop Corn Date Planted 4/26 & 28/03
Variety 34B23 Pioneer
Seeding Rate 30,000 seeds/A Planter Used JD 1760
Planting depth 1.5 inches
Year 2002 Crop Wheat & Soybeans
Acres in plot site 1.81A
Fall Tillage Strip-till Spring Tillage none Average Population: 30,000 plants/acre
Percent Emergence: ~100%

Fertility Program:
Fertilizer Applied: 200lbs, 0-0-60, 100 &150lbs, 11-52-0, 10lbs, Zinc Starter 180lbs, 10-34-0
Side-dress and Type used: 183lbs, 82-0-0, AA
Total N Applied: 168lbs Actual N

Herbicide/Insecticide Program:
Pre-emerge: 1qt Princep, 1qt Clearout (glyphosate)
Post-emerge: 3oz, Hornet, 1qt, Atrex Insecticide
Applied: Lorsban

Harvest Data:
Date Harvested 11/03/03 Combine Used JD 9510
Yield Monitor Used Greenstar
Average Ear Count: 29/30 stalks
% Stalks w/ Ears: 96.7%

Rainfall Amounts and Dates: 16-June, (6.5/10 inch) 30-June, (4/10 inch) 11-July, (2,7/10 inches) 22-July, (1,1/10 inches) 6-August, (4&6/10 inches) 15-August, (1 inch)

YIELD DATA:

Practice	Yield	Moisture
Strip-till Wheat Stubble	192bu/A	18.9%
Strip-till Soybean Stubble	170bu/A	19.1%

* Some Replant and water damage in Soybean stubble plot.

Farm Rettig County Henry
Plot Type S-B-S, Strip-till vs. No-till vs. Row Cleaner

Planting/Tillage Information:
Crop Popcorn Date Planted April 29th
Variety VYP 214
Seeding Rate 33,000 plants/acre
Planter Used JD 1770
Planting depth 1.5 inches
Year 2002 Crop Soybeans
Fall Tillage Strip-till Spring Tillage No-till
Average Population: 30,000 plants/acre
Percent Emergence: 90.9%

Fertility Program:
Fertilizer Applied: (Fall) (Strip-till) no fertilizer, (no-till) 250# Potash broadcast
Starter: 15gal, 50% mix 10-34-0 and 28% Nitrogen,
Side-dress: 140# actual, Anhydrous Ammonia

Harvest Data:
Combine Used JD 9750 sts
Yield Monitor Used Greenstar
Average Ear Count: 29/30 stalks
% Stalks w/ Ears: 96%

Rainfall Amounts and Dates: 3-June, (1/2 inch) 18-June, (1&2/10 inches) 11-July, (2 inches) 6-August, (4&4/10 inches) 8-August, (1/2 inch) 11-August, (1/2 inch)

YIELD DATA:

Practice	Yield	Moisture
Strip-till Soybean Stubble	5940lb/A	16.1%
No-till Soybean Stubble	5880lb/A	16.9%
Row Cleaner Soybean Stubble	5810lb/A	16.7%

Farm Rettig **County** Henry
Plot Type Replicated Nitrogen Trial

Planting/Tillage Information:
Crop Corn Date Planted April 29th Variety HW 331
Seeding Rate 32,000 seeds/acre
Planter Used JD 1770
Planting depth 1.5 inches
Year 2002 Crop Soybeans
Spring Tillage No-till
Average Population: 30,500 plants/acre
Percent Emergence: 95.3%

Fertility Program:
Fertilizer Applied: (Fall) 250# Potash Broadcast
Starter: 15gal mix 10-34-0 and 28%, (half and half)
Side-dress: Anhydrous Ammonia
Full Rate: 150# -10% Rate: 135# -20% Rate: 120#

Herbicide/Insecticide Program:
Post-emerge: (Airplane) Quadris, Tilt, Warrior

Harvest Data:
Combine Used JD 9750 sts
Yield Monitor Used Greenstar
Average Ear Count: 30/30 stalks
% Stalks w/ Ears: ~100%

Rainfall Amounts and Dates: 3-June, (1/2 inch) 18-June, (1&2/10 inches) 11-July, (2 inches) 6-August, (4&4/10 inches) 11-August, (1/2 inch)

YIELD DATA:

Practice	Yield	Moisture
Full Rate	6518llb/A	16.5%
-10% Rate	6485lb/A	16.4%
-20% Rate	6425lb/A	16.2%
-10%	6449lb/A	16.5%
Full Rate	6355lb/A	16.7%
-20%	6299lb/A	16.5%
-20%	6340lb/A	16.4%
-10%	6372lb/A	16.4%
Full Rate	6373lb/A	16.7%
Full Rate	6448lb/A	16.5%
-20%	6429lb/A	16.3%
-10%	6435lb/A	16.4%
Average Full Rate	6423.5lb/A	16.6%
Average –10% Rate	6435.25lb/A	16.48%
Average –20% Rate	6373.25lb/A	16.35%

Farm Vorwerk **County** Henry

Plot Type SBS, Strip-till vs. Disk w/ Strip-till vs. Conventional tillage

Planting/Tillage Information:
Crop Popcorn Date Planted 4/28/03
Variety R 128YH
Seeding Rate 30,000 plants/acre
Planter Used JD 1770 Vac
Year 2002 Crop Soybeans Acres in plot site 44 acres
Fall Tillage Strip-till and Disk w/ Strip-till
Spring Tillage Conventional, field cultivate once on worked ground
Average Population: 29,500 plants/acre
Percent Emergence: 98%

Fertility Program:
Fertilizer Applied: Fall Strip-till: 208# 0-0-60, 52# 18-46-0, 10# Sulfur 90%, 5# Zinc 36% 220# 82-0-0, 1QT N-Serve
Starter: On planter conventional-till, 54# N, 27# P2O5, 5.5# K
Side-dress: 175# Actual N, conventional-till
Total N Applied: 229# N, conventional-till spring

Herbicide/Insecticide Program:
Pre-emerge: 2qt Bicep
Post-emerge: Spot spray, Buctril 1pt/acre
Insecticide Applied: Capture 5.1oz/acre

Harvest Data:
Date Harvested 10/18/03 Combine Used JD 9500
Yield Monitor Used Greenstar
Average Ear Count: 28.3/30 stalks
% Stalks w/ Ears: 95%

Rainfall Amounts and Dates: 2-June, (1-2 inch) 16-June, (8/10 inch) 23-June, (1/2 inch) 10-July, (2 1/10 inches) 31-July, (2&9/10 inches) 6-August, (3&1/10 inches)

YIELD DATA:

Practice	Yield	Moisture
Strip-till Soybean Stubble	5965lb/A	18.7%
Disc/ Strip-till Soybean Stubble	6115lb/A	17.8 %
Conventional till	5465lb/A	17.9%

Farm Bischoff **County** Henry

Plot Type Replicated, AerWay vs. No-till Soybeans

Planting/Tillage Information:
Crop Soybeans Date Planted 5/20/03
Variety Pioneer 93B68
Seeding Rate 200,000 plants/acre
Planter Used Tye No-till Drill
Year 2002 Crop Corn Acres in plot site 20 acres
Fall Tillage none and AerWay Spring Tillage None
Population: 189,100 plants/acre
Percent Emergence: 94.5%

Fertility Program:
Fertilizer Applied: Variable Rate N-Viro by Grid Sampling

Herbicide/Insecticide Program:
Pre-emerge: 3pt Extreme, 1pt 2,4-D ester, 17# Ammonium Sulfate/100gal
Post-emerge: 1qt Credit extra (glyphosate), 17# Ammonium Sulfate/100gal

Harvest Data:
Date Harvested 10/12/03
Combine Used: Gleaner L2
Yield Monitor Used: Field Star

Rainfall Amounts and Dates: 3-June, (7/10 inch) 16-June, (6/10 inch) 23-June, (2/10 inch) 10-July, (2.75 inches) 31-July, (1&7/10 inches) 6-August, (2 inches)

YIELD DATA:

Practice	Yield	Moisture
No-till 1	44.2 bpa	11.4%
AerWay 1	41.6 bpa	11.2%
AerWay 2	42.9 bpa	11.2%
No-till 2	39.92 bpa	11.6%
No-till 3	40.3 bpa	11.4%
AerWay 3	39.9 bpa	11.5%
AerWay 4	39.7 bpa	11.0%
No-till 4	37.6 bpa	11.4%
Average AerWay	41.03 bpa	11.23%
Average No-till	40.51bpa	11.45%

Farm Hesterman **County** Henry

Plot Type Replicated AerWay vs. No-till Soybeans

Planting/Tillage Information:
Crop Soybeans Variety 93B82 Pioneer
Seeding Rate 225,000plants/A
Planter Used JD 750 Drill
Year 2002 Crop Corn
Acres in plot site 20 acres
Fall Tillage none Spring Tillage AerWay
Average Population: 182,625 plants/acre

Fertility Program:
Fertilizer Applied: none

Herbicide/Insecticide Program:
Pre-emerge: Canopy XL with Boundary
Post-emerge: none

Harvest Data:
Combine Used JD 9500
Yield Monitor Used Ag Leader

Rainfall Amounts and Dates: 2-June, (3.5/10 inch) 18-June, (1&4/10 inches) 11-July, (2&4/10 inches) 6-August, (5 inches) 11-August, (3/10 inch)

YIELD DATA:

Practice	Yield	Moisture
AerWay 1	47.63 bpa	12.9%
No-till 1	46.79 bpa	12.7%
AerWay 2	46.05 bpa	12.6%
No-till 2	45.74 bpa	12.8%
AerWay 3	46.43 bpa	12.7%
No-till 3	45.61 bpa	12.6%
AerWay 4	46.01 bpa	12.7%
No-till 4	43.83 bpa	12.9%
Average AerWay	46.53 bpa	12.73%
Average No-till	45.49 bpa	12.75%

Farm Homan **County Henry**

Plot Type S-B-S, AerWay vs. No-till vs. Disked Stalks Soybeans

Planting/Tillage Information:
Crop soybeans Date Planted 5/23/03
Variety Pioneer 93B67 treated
Seeding Rate 195,000 plants/acre
Planter Used Heniker 4840 air seeder
Year 2002 Crop corn
Acres in plot site 72 acres
Fall Tillage AerWay and Disk stalks
Spring Tillage none
Average Population: 167,700 plants/acre
Percent Emergence: 86%

Fertility Program:
Fertilizer Applied: 125# Potash

Herbicide Program:
Pre-emerge: Roundup 1qt/ Aim .5oz
Post-emerge: 1qt Roundup

Harvest Data:
Combine Used JD 9500
Yield Monitor Used Ag Leader 3000

Rainfall Amounts and Dates: 2-Jun, (1/2 inch) 16-Jun, (1/2 inch) 23-Jun, (4/10 inch) 10-July, (1&6/10 inch) 31-July, (2&3/10 inches) 6-August, (3 inches)

YIELD DATA:

Practice	Yield	Moisture
AerWay Soybeans	42.3 bpa	15.04%
No-till Soybeans	42.0 bpa	15.04%
Disc Stalks Soybeans	41.25 bpa	15.04%

Farm Benecke **County Henry**

Plot Type Replicated No-till vs. Minimum-till (Mulch Master, Fall)

Planting/Tillage Information:
Crop Corn Date Planted April 24th
Variety Golden Harvest 8906
Seeding Rate 29,000 plants/acre
Planter Used JD 7200 vac
Planting depth 1.5 inches
Year 2002 Crop Soybeans
Acres in plot site 19 A
Fall Tillage Mulch master Spring Tillage No-till
Average Population: 28,500 plants/acre
Percent Emergence: 98.3%

Fertility Program:
Fertilizer Applied: (Fall) 250# 0-9-49
Starter: 22 gal 23-9-0 with Sulfur and Zinc
Side-dress: Anhydrous Ammonia, 140# actual
Total N Applied: 194# actual

Herbicide/Insecticide Program:
Pre-emerge: Keystone 2.4qt, Atrazine 1pt
Post-emerge: spot sprayed with Distinct
Insecticide: None

Harvest Data:
Ave. Ear Count: 29.2/30 stalks
% Stalks w/ Ears: 97.2%

Rainfall Amounts and Dates: 11-June, (3/10 inch) 24- June, (1 inch) 10-July, (4 inches) 23-July, (1&2/10 inches) 6-August, (3&1/10 inches) 12-August, (1&2/10 inches)

YIELD DATA:

Practice	Yield	Moisture
Minimum-till	191.4 bpa	21.1%
No-till	190.3 bpa	21.7%
Minimum-till	199.6 bpa	21.4%
No-till	187.8 bpa	21.4%
Minimum-till	198.6 bpa	21.1%
Average No-till	189.05 bpa	21.55%
Average Minimum till	196.53 bpa	21.2%

Farm Michaelis **County Henry**

Plot Type S-B-S, No-till vs. Minimum-till (Mulch Master, Spring)

Planting/Tillage Information:
Crop Corn Date Planted 5-25-03 replant
Variety Golden Harvest 8799 Seeding Rate 27,700
Planter Used JD 7000 Planting depth 1.25-1.75in.
Year 2002 Crop soybeans
Acres in plot site 12.3 acres
Fall Tillage none
Spring Tillage Mulch master and No-till
Average Population: 28,000 plants/acre
Percent Emergence: approx. 100%

Fertility Program:
Starter: 200# 12-27-17 on planter
Side-dress: 160# of 82% Anhydrous Ammonia
Total N Applied: 184# Total N

Herbicide/Insecticide Program:
Pre-emerge: 1qt Roundup, 2.5qt Keystone, 1pt Atrex
Post-emerge: none
Insecticide Applied: none

Harvest Data:
Date Harvested 11/17/03
Combine Used JD 7720
Yield Measure Used Weigh Wagon

Rainfall Amounts and Dates:
24-June, (1&2/10 inches)
10-July, (4&6/10 inches)
6-August, (4&6/10 inches)
12-August, (7/10 inch)

YIELD DATA:

Practice	Yield	Moisture
Minimum-till	177.43 bpa	22.3%
No-till	177.59 bpa	22.3%

Farm Wendt **County Henry**

Plot Type Replicated Minimum-till (Mulch master) vs. Deep tillage (Landol tool)

Planting/Tillage Information:
Crop Corn Date Planted April 26th
Variety Golden Harvest 8799
Seeding Rate 30,000 plants/acre
Planter Used III 900 Planting depth 1.75inches
Year 2002 Crop Soybeans Acres in plot site 50 acres
Fall Tillage Sub-tillage/Mulch-tillage
Spring Tillage None
Average Population: 29,000 plants/acre
Percent Emergence: 96.7%

Fertility Program:
Fertilizer Applied: 250#, 0-0-60
Starter: 34-32-0, (20gal, 17-16-0) and Zinc
Side-dress: 160#, Anhydrous Ammonia
Total N Applied: 194# Actual

Herbicide Program:
Pre-emerge: Bicep II Magnum
Post-emerge: Distinct, 4oz

Harvest Data:
Ave. Ear Count: 29.5/30 stalks
% Stalks w/ Ears: 98.3%

Rainfall Amounts and Dates:
3-June, (7/10inch) 11-June, (3,5/10inch)
24-June, (1 inch) 10-July, (3, 6/10)
6-August, (3.5 inches) 12-August, (9/10 inch)

YIELD DATA:

Practice	Yield	Moisture
Minimum-till	195.73 bpa	19.24%
Deep-till	199.85 bpa	19.00%
Deep-till	199.12 bpa	19.00%
Minimum-till	189.70bpa	19.13%
Minimum-till	191.86 bpa	19.60%
Deep-till	197.23 bpa	19.58%
Deep-till	199.88 bpa	19.71%
Minimum-till	199.61 bpa	19.52%
Average Deep-till	199.02 bpa	19.25%
Average Minimum till	194.20 bpa	19.46%

Farm Cordes **County Henry**

Plot Type S-B-S, Strip-till w/ Sub-till vs. Regular Strip-till

Planting/Tillage Information:
Crop Corn Date Planted 4/24/03
Variety Rupp 1609 Seeding Rate 32,000 seeds/A
Planter Used JD 1760
Planting depth 1.5 inches
Year 2002 Crop Soybeans
Fall Tillage Sub-till (Blue Jet), Strip-till
Spring Tillage none
Average Population: 29,000 plants/acre
Percent Emergence: 91%

Fertility Program:
Fertilizer Applied: In Fall with Strip-tiller), dry starter and 200lbs AA

Herbicide/Insecticide Program:
Pre-emerge: Bicep, Simazine
Post-emerge: Spot Spray only
Insecticide Applied: none, (On seed Treatment)

Harvest Data:
Combine Used JD 7720 II
Yield Monitor Used Scales
Ave. Ear Count: 27.3/30 stalks
% Stalks w/ Ears: 92%

Rainfall Amounts and Dates: 3-June, (5.5/10 inch) 11-June, (2/10 inch) 23-June, (8/10 inch) 10-July, (2 inches) 31-July, (1&6/10 inches) 6-August, (1&7/10 inches) 12-August, (6/10 inch)

YIELD DATA:

Practice	Yield	Moisture
Strip-till, Regular	193 bpa	17.5%
Strip-till, with Sub-till	228 bpa	18.6%

* Actual difference in yields may be less due to field tile location and population stand differences.

Farm Durham **County Henry**

Plot Type S-B-S, Strip-till vs. No-till

Planting/Tillage Information:
Crop Corn Date Planted 4/28/03
Variety Pioneer 34- M-35
Seeding Rate 31,000 plants/acre
Planter Used JD 7000 Planting depth 1.25 inches
Year 2002 Crop Wheat Acres in plot site 23 acres
Fall Tillage Strip-till
Spring Tillage None
Average Population: 31,000 plants/acre
Percent Emergence: ~100%

Fertility Program:
Fertilizer Applied: (Strip-till) (Fall) 245#, 0-29-22, 185 units NH_3, 1# Zinc, 4# Sulfur,
(No-till) (Spring) 245#, 0-29-22
Starter: (Strip-till) 15gal, 26-0-0, (No-till), 30gal, 17-16-0, 1# Zinc, 4# Sulfur
Side-dress and Type used: (Strip-till), None, (No-till), 40gal 28%
Total N Applied:
(Strip-till), 224 units, (No-till), 196 units

Herbicide/Insecticide Program:
Pre-emerge: Bicep, Simazine, 2,4-D

Harvest Data:
Combine Used: JD 9500
Yield Monitor Used: Greenstar
Average Ear Count: 29.2/30 stalks
% Stalks w/ Ears: 97.3%

Rainfall Amounts and Dates: 2-June, (1/10 inch) 19-June, (1& 6/10inches) 30-June, (5.5/10 inch) 11-July, (2 & 2/10 inches) 22-July, (1 inch) 6-August, (3&8/10 inches)

YIELD DATA:

Practice	Yield	Moisture
Strip-till	221.26 bpa	n/a
No-till	216.98 bpa	n/a

Farm Durham **County Henry**

Plot Type S-B-S, Strip-till wheat stubble vs. Strip-till Stale Seedbed

Planting/Tillage Information:
Crop Corn Date Planted 4/26/03
Variety Pioneer 34- M- 95
Seeding Rate 31,000 plants/acre
Planter Used JD 7000 Planting depth 1.5 inches
Year 2002 Crop Wheat Acres in plot site 50 acres
Fall Tillage Strip-till Spring Tillage None
Average Population: 30,000 plants/acre
Percent Emergence: 96.7%

Fertility Program:
Fertilizer Applied: 245#, 0-29-22, 185 units NH_3
Starter: 15gal, 26-0-0, 1# Zinc, 4# Sulfur
Side-dress: None
Total N Applied: 224 units

Herbicide Program:
Pre-emerge: Bicep, Simazine, 2,4-D

Harvest Data:
Date Harvested 10/30/03
Combine Used JD 9500
Yield Monitor Used Greenstar
Average Ear Count: 29.5/30 stalks
% Stalks w/ Ears: 98.3%

Rainfall Amounts and Dates: 2-June, (1/10 inch) 19-June, (1 2/10 inches) 30-June, (1/2 inch) 11-July, (2 inches) 22-July, (1 inch) 6-August, (4 inches) 15-August, (8/10 inch)

YIELD DATA:

Practice	Yield	Moisture
Strip-till wheat Stubble	222.24 bpa	n/a
Strip-till in Stale Seedbed	217.95 bpa	n/a

Farm Meyer **County Henry**

Plot Type S-B-S, Strip-till w/ dry fertilizer vs. Strip-till w/o dry fertilizer

Planting/Tillage Information:
Crop Corn Date Planted April 28th
Variety Wellman 1553BTSeeding Rate 30,500
Planter Used JD 7200 Planting depth 1.75 inches
Year 2002 Crop Soybeans
Fall Tillage Strip-till with Dry Fertilizer
Spring Tillage No-till
Average Population: 28,000 plants/acre
Percent Emergence: 91.8%

Fertility Program:
Starter: 180# 7-17-40
Side-dress: 200# Anhydrous Ammonia

Herbicide/Insecticide Program:
Pre-emerge: Bicep II

Harvest Data:
Date Harvested 11/02/03
Combine Used JD 9510
Yield Monitor Used Greenstar
Average Ear Count: 27.6/30 stalks
% Stalks w/ Ears: 92.1%

Rainfall Amounts and Dates: 19-June, (1 4/10 inch) 30-June, (4/10 inch) 11-July, (2 inches) 22-July, (1, 1/10 inches) 6-August, (4&3/10 inches)

YIELD DATA:

Practice	Yield	Moisture
Strip-till w/ Dry Fertilizer	175.0 bpa	19.0%
Strip-till w/o Dry Fertilizer	169.0 bpa	21.0%

Farm Osborn **County Williams**

Plot Type Replicated Strip-till vs. Minimum-till (Phoenix tool)

Planting/Tillage Information:
Crop Corn Date Planted 5/21/03 Variety Pioneer 53Y54 Seeding Rate 28,000
Planter Used JD 7240
Year 2002 Crop Soybeans
Fall Tillage Strip Till
Spring Tillage Phoenix Rotary Harrow
Average Population: 27,500 plants/acre

Fertility Program:
Fertilizer Applied: 185# 9-41-9/Zinc sulfate, 200# 0-0-60 in fall
Side-dress and Type used: 60 gal 28%
N Applied: 200#

Herbicide/Insecticide Program:
Pre-emerge: Field Master

Harvest Data:
Date Harvested 11/7/2003
Combine Used JD 7720
Average Ear Count: 27.5/30 stalks
% Stalks W/Ears: 92%

Rainfall Amounts and Dates: 17-June, (1&1/10 inches) 25-June, (2/10 inch) 15-July, (3.5 inches) 24-July, (1&1/10 inches) 14-August, (3.5 inches)

YIELD DATA:

Practice	Yield	Moisture
Strip-till Fall	111.2 bpa	25.3%
Minimum-till Spring	120.3 bpa	25.1%
Strip-till Fall	125.9 bpa	24.0%
Minimum-till Spring	98.3 bpa	24.8%
Strip-till Fall	105.9 bpa	24.7%
Minimum-till Spring	114.7 bpa	24.2%
Average Strip-till	114.3 bpa	24.7%
Average Minimum till	111.1 bpa	24.7%

Farm Bennett **County Williams**

Plot Type S-B-S, Strip-till Stale seedbed vs. Conventional Stale seedbed

Planting/Tillage Information:
Crop Corn Date Planted 4/27/03
Variety DK 58-24 Seeding Rate 27,000 seeds/A
Planter Used JD
Planting depth 1.5in.
Year 2002 Crop Soybeans Acres in plot site 20A
Fall Tillage Finishing tool, Strip-till
Spring Tillage none
Average Population: 25,000 plants/acre
Percent Emergence: 93%

Fertility Program:
Fertilizer Applied: 200lbs, 0-0-60, 50lbs, 11-52-0
Starter 200lbs, 10-34-0 Weed and Feed: 30 gal, 28%
Side-dress and Type used: 50gal, 28%
Total N Applied: 180 units actual

Herbicide/Insecticide Program:
Post-emerge: Round Up
Insecticide Applied: none

Harvest Data:
Date Harvested 10/30/03
Average Ear Count: 29.2/30 stalks
% Stalks w/ Ears: 97.3%

Rainfall Amounts and Dates:
15-July, (2,6/10 inches) 24-July, (1 inch)
14-August, (3.5 inches)

YIELD DATA:

Practice	Yield	Moisture
Strip-till Stale Seedbed	183 bpa	19%
No-till Stale Seedbed	180 bpa	19%

2002 Farm Cluster Plot Data

Farm: Disbro **County: Williams**

Plot Type: S-B-S, Strip-till (wheat stubble) vs. No-till (wheat stubble)

Planting/Tillage Information:
Crop Corn Date Planted May 1st
Variety Brodbeck SX810
Seeding Rate 27,500 plants/acre
Planter Used 6600 White, six row
Planting depth 1.5in.
Year 2002 Crop wheat Acres in plot site 14.3 acres
Fall Tillage Strip-till
Spring Tillage No-till
Average Population: 27,100 plants/acre
Percent Emergence: 98.5%

Fertility Program:
Fertilizer Applied: (Strip-till) 300# Potash in row, (No-till) 300# Potash broadcast

Starter: 10gal 10-34-0 with 1pt Chelated Zinc
Side-dress: (At planting 5in. from row in band) 60gal 28% Nitrogen
Total N Applied: 190 units

Herbicide/Insecticide Program:
Pre-emerge: 2.4qt Harness Extra 5.6
Insecticide Applied: 8# Lorsban 15g

Harvest Data:
Date Harvested Dec. 4
Ave Ear Count: 29/30 stalks
% Stalks w/ Ears: 96%

Rainfall Amounts and Dates: 15-July, (3 inches) 24-July, (1 inch) 14-Aug., (3.5 inches)

YIELD DATA:

Practice	Yield	Moisture
Strip-till wheat Stubble	172.1 bpa	19.9%
No-till wheat Stubble	175.7 bpa	19.6%

Farm: Wachtman
Equipment – Remlinger Strip Tiller
2001 Crop – Soybeans 2002 Crop - Corn
Date Planted 5/31/02 Planting Rate 30,000
Variety 34B23, 34N16
Fall Tillage – 11/27/01 Strip Tilled
Fertilizer Applied – 122# 82-0-0, 150# 0-0-60, 80# 11-52-0, 5# Zinc, 5# Manganese, .8 qt. N-serve
Nitrogen Applied - 6/12/02 90# 82-0-0
Herbicide - 5/31/02 1 qt Princep 4L/SB Oil, 1 qt. Round Up
- 6/12/02 1.5 qt Atrazine 4L/1 pt. SB Oil

2001 Crop – Wheat 2002 Crop – Corn
Date Planted 5/5/02 Planting Rate 30,000
Variety 34M94
Fall Tillage – 8/6/01 Chisel Plow 8/9/01 Land Level 12/4/01 Strip Till
Fertilizer Applied – 155# 82-0-0, 150# 0-0-60, 40# 11-52-0, 5# Zinc 1qt. N-serve
Nitrogen Applied - 6/12/02 24 gal 28-0-0
Herbicide –
4/26/02 1 qt Princep 4L/1 pt. SB Oil, 1 qt. Round Up
6/17/02 2 oz Hornet/302 pt. SB Oil
Harvest Date – 10/25/02

2001 Crop – Wheat 2002 Crop – Corn
Date Planted 5/11/02 Planting Rate 30,000
Variety 34B23, LG, 34B24, 33T90
Fall tillage – 11/27/01 Strip Tilled

Fertilizer Applied – 195# 82-0-0, 150# 0-0-60, 80# 11-52-0, 5# Zinc, 1qt. N-serve

Herbicide – 4/26/02 1 qt Princep 4L/1 pt. Soybean Oil, 1.24 pints Round Up, 1.5 qt Atrazine 4L/ 1pt Soybean Oil 2 oz Hornet

YIELD DATA:

Practice	Yield	Moisture
Strip Till, Soybean Stubble	136 bpa	n/a
Strip Till, Wheat Stubble	144 bpa	n/a
Strip Till, Wheat Stubble	141 bpa	n/a

Farm: Vorwerk
Equipment – Remlinger Strip Tiller
2001 Crop – Corn 2002 Crop – Corn
Date Planted 5/5/02 Planting Rate 30,000
Variety P225
Fall Tillage – 11/23/01 Strip Tilled

Strip Till Plot

Fertilizer Applied – 200# 0-0-60, 50# 11-52-0, 5# Zinc, 5# Manganese
- 5/5/02, 165# 12-20-4 in planter
Nitrogen Applied - 210# 82-0-0, 8 qt. N-serve
Herbicide - 4/26/02, 2 qt. Bicep + 1 pt. Crop Oil + 1.85 pt. Weedone
- 6/9/02 8 oz. Clarity + ½ gal 28%

Conventional Till Plot

Fertilizer Applied – 200# 0-0-60, 50# 11-52-0, 5# Zinc, 5# Manganese
- 5/5/02, 165# 12-20-4 in planter

Nitrogen Applied – 180# 82-0-0 Side dressed
Herbicide - 4/26/02, 2 qt. Bicep + 1 pt. Crop Oil + 1.85 pt. Weedone
- 6/9/02 8 oz. Clarity + ½ gal 28%

YIELD DATA:

Practice	**Yield**
Strip till Popcorn	3705 ppa
Conventional Tillage Popcorn	3537 ppa
Strip Till Popcorn	3631 ppa
Conventional Tillage Popcorn	3472 ppa

Farm: Homan
Equipment – AerWay
2001 Crop – Corn 2002 Crop – Soybeans Date Planted 5/05/02
Seeding Rate 210,000 Planter Tye Drill &White Planter
Fall Tillage – AerWay/Disk/Chisel Plow
Fertilizer Applied 150# 0-0 60
Herbicide – Pre-emergent - Roundup/2,4-D
Post Emergent – Roundup
Date Harvested – 10/11/02 Field Yield 63 bpa
Combine JD 9500 Yield Monitor Ag Leader

YIELD DATA:

Practice	**Yield**	**Moisture**
Spring AerWay	57 bpa	12.7%
Fall AerWay	65-67 bpa	12.7%
Fall Disk/Light Spring AerWay	62 bpa	12.7%
Fall Chisel (30" Rows)	61 bpa	12.7%

Farm: Hesterman
Equipment – AerWay Residue Manager
2001 Crop - Corn
2002 Crop – Soybeans
Date Planted 6/1/02 Seeding Rate 212,000
Planter JD 750 Drill
Herbicide - Canopy XL/Boundary
Post Emergent: none
Date Harvested – 10-23-02
Combine – JD 9500
Yield Monitor – Ag Leader 3000
Field Yield 62.4 bpa Moisture 13.3%

YIELD DATA:

Practice	**Yield**	**Moisture**
AerWay	61.89 bpa	13.7%
No-Till	61.22 bpa	13.3%
AerWay	61.56 bpa	13.3%
No-Till	58.85 bpa	13.1%
AerWay	65.04 bpa	13.4%
No-Till	63.85 bpa	13.4%
AerWay	62.95 bpa	13.5%
No-Till	60.04 bpa	13.5%

Farm: Bischoff
Equipment – AerWay Residue Manager
2001 Crop – Corn 2002 Crop – Soybeans
Variety – Wellman 3236
Spring Tillage – AerWay
Date Planted 5/27/02 Seeding Rate 215,000
Planter Tye No Till Drill
Herbicide – Roundup, LV 4, Request Post, 1 pt. Round Up
Date Harvested – 10-9-02 Combine –Gleaner
Yield Monitor – AGCO Field Star
Field Yield 55.82 bpa Moisture 12.5%

YIELD DATA:

Practice	**Yield**	**Moisture**
No-Till	49.35 bpa	12.0%
AerWay	56.74 bpa	12.1%
AerWay	58.15 bpa	12.2%
No-Till	61.85 bpa	12.4%
No-Till	59.13 bpa	13.0%
AerWay	44.13 bpa	12.3%
AerWay	45.22 bpa	12.6%
No-Till	48.26 bpa	13.1%

Farm: Osborn
Equipment – DMI Nutriplacr
2001 Crop – Soybeans 2002 Crop – Corn
Variety Pioneer Date Planted – 5/28/02 Seeding Rate – 27,500
Fertilizer Applied – 200# 9-41-9/Zin in Row Starter; 150# 0-0-60
Nitrogen Applied 148# 82-0-0 Herbicide – Hornet

YIELD DATA:

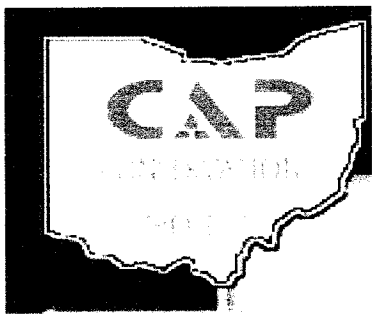
Practice	Yield	Moisture
Conventional-Till	57.61 bpa	21.1%
Strip-Tillage	72.42 bpa	19.3%
Conventional-Till	69.04 bpa	19.7%
Strip-Tillage	76.17 bpa	19.2%
Conventional-Till	46.46 bpa	20.8%
Strip-Tillage	77.56 bpa	18.5%

Farm: Oberlin
Equipment – DMI Nutriplacr
2002 Crop – Corn Planting Date 5/22/02
Seeding Rate 30,000
Fertilizer Applied – 250# 0-0-60; 75# 11-52-0
Row starter – 10-34-0/Zinc. 15 gal/A.
Nitrogen Applied - 30 Gallon 28%/A
Demonstration Type – Side x side

YIELD DATA:

Practice	Yield	Moisture
Strip-Till	104.71 bpa	16.3%
No-Till	86.42 bpa	15.1%
Conventional-Till	76.71 bpa	15.7%

"Using Conservation Tillage to Improve Water Quality."



Farm: Coles
Equipment – DMI Nutriplacr
2001 Crop - Soybeans 2002 Crop – Corn
Date Planted – 5/30/02
Variety Dekalb 537
Tillage Method – Strip Till vs. No Till
Demonstration Type – Side x Side
Soil Test – pH 6.0, P 88, K 437
Harvest Date – 10/13/02

YIELD DATA:

Practice	Yield	Moisture
Strip-Till	70.43 bpa	15.7%
No-Till	58.76 bpa	15.7%

Explanation: No-Till had heavy dandelion pressure that was partially removed by strip tillage. This may have affected the yield obtained.

JG

FARM CLUSTER FARM INFORMATION FORM

General Information: Farm _____ Plot Type _____

Planting/Tillage Information:

Crop _____ Date Planted _____ Variety _____

Seeding Rate _____ Planter Used _____ Year 2001 Crop _____

Fall Tillage _____ Date Completed_____

Spring Tillage _____ Date Completed_____

Fertility Program:

Fertilization Program: _____

Nitrogen Applied: Pre-emerge: _____ Type Used: _____

Side-dress: Type Used:_____ Total N Applied: _____

Herbicide/Insecticide Program:

Herbicides Applied: Pre-emerge:_____Post-emerge:_____

Insecticide Applied: _____

Harvest Data:

Date Harvested _____ Field Yield _____ bpa Moisture Content _____ %

Comparison Yield _____ bpa Moisture Content _____ %

Combine Used _____ Yield Monitor Used _____

Average Stalk Count:_____Average Ear Count:_____Stalk-to-Ear Ratio:_____

Weather Information:

Rainfall Amounts and Dates_____

Generall Comments or Irregular Events:_____

_____

_____

GUIDELINE FOR RESIDUE MANAGEMENT DEMONSTRATION Illustration #2.

This program has been initiated to better achieve Lake Erie water quality goals assigned to NW Ohio counties. The intent is to give farmers the ability to collect quality data from practices aimed at reducing soil loss.

Intended Users Of This Information

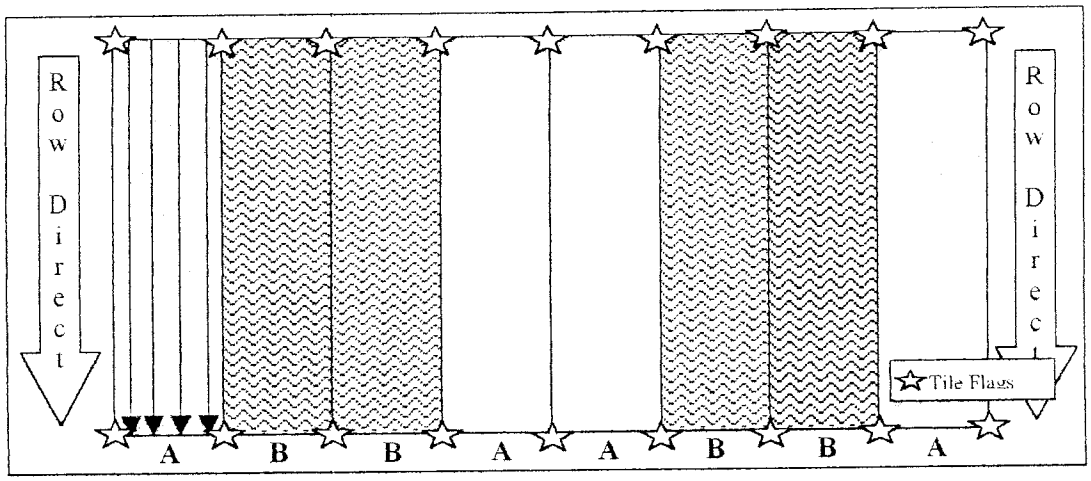
1. Farmers demonstrating residue management

Suggestions On Conducting The Residue Management Demonstration

- You may choose any tool available, so long as the tool chosen is designed to mix the soil and residue without causing soil compaction layering to reoccur.
- The plot was to have been sub tilled last fall or be absent of dense soil layering. In the event that fall wetness prevented sub tillage, proceed with the residue management phase.
- Sub-tillage is defined as (1) penetration of the soil's b-horizon 1.5 inches while (2) leaving at least thirty percent surface residues. Both criteria one and two (above) must be met.

Plot Design Ideas

- Each plot should consist of four replications of each treatment. Plot layout should be similar to figure one below, where treatment A represents the residue management and treatment B is the traditional grower practice. Each treatment should be at least wide enough to accommodate four passes of the combine. A 6-row 30" header would require plots to be a minimum of 60' wide. The tillage passes should be completed in the same direction as planting, in other words, plots should run with the rows.
- The corners of each treatment should be marked with a tile flag to spatially identify each replication.
- Additionally, each treatment boundary should be recorded with an accurate GPS unit. Either your cooperating fertilizer retailer or Joe Nester (419-658-8866) should be consulted prior to completing this.



- If possible, field should have one soil type. If multiple soil types, these should run perpendicular to the plot. Growers will be asked to identify these at planting and again on the yield map.
- Remember to keep the variety constant throughout the plot.
- Tile lines should also run across rows. If not possible, these areas should be considered at harvest.
- The minimum information that generally needs to be recorded is found on the field information sheet.
- If possible, pictures should be taken of the tillage operation in progress as well as the device used to complete the operation. (This assists in analysis if questions arise as to the conditions of the plot.)

General Plot Location -- Plat maps with field highlighted; road and closest crossroads are helpful.

GUIDELINES FOR NITROGEN DEMONSTRATIONS Illustration #3.

This program has been initiated to better achieve Lake Erie water quality goals assigned to NW Ohio counties.

Suggestions On Conducting The Demonstration

- The suggestions listed in this article are directed at comparing rates of nitrogen application. There are no specifics parameters or restrictions regarding the type of material applied or the timing of the applications. Remember that each additional practice will enter another variable into the demonstration.
- The total rate of application should be adjusted by the sidedress application as in the following example.

Example Of A Typical Nitrogen Fertilization Program Demonstration

Zone A: Full Rate	Zone B: 10% less than full rate	Zone C: 20% less than full rate
130# 18-46-0 Fall = 23.4# N	130# 18-46-0 Fall = 23.4# N	130# 18-46-0 Fall = 23.4# N
6 Gal 10-34-0 = 6.6# N	6 Gal 10-34-0 = 6.6# N	6 Gal 10-34-0 = 6.6# N
15 Gal 28-0-0 = 45 # N	15 Gal 28-0-0 = 45 # N	15 Gal 28-0-0 = 45 # N
Sidedress full rate = 140# N	Sidedress @ -10% = 118.5# N	Sidedress @ -20% = 97# N
Total N applied = 215# N	Total N applied = 193.5#	Total N applied = 172#
	(215# x 10% = 21.5# less N)	(215 x 20% = 43# less N)

	101	100	103	104	201	202	204	203	301	304	302	303	401	403	404	402	
Border	Full	-10%	-20%	Test	Full	-10%	Test	-20%	Full	Test	-10%	-20%	Full	-12%	Test	-10%	Border
	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	

Randomized Replicated Design For Soil Test Prior To Side Dress Application Figure 1.

Allow space for 156 rows, 144 rows in plot plus 12 minimum rows for the two borders.

- If possible, field should have one soil type. If multiple soil types, these should run perpendicular to the plot. Growers will be asked to identify these at planting and again on the yield map.
- Remember to keep the variety constant throughout the plot.
- Tile lines should also run across rows. If not possible, these areas should be considered at harvest.
- Each treatment should be wide enough to accommodate two combine passes. A 6-row combine would take a minimum 30-foot wide plot. Plot design is based on common 6 &12 row combines.
- The corners of each treatment should be marked with a tile flag to spatially identify each replication. This will facilitate making nitrogen applications with three changes on the applicator.
- Each treatment boundary should be recorded with an accurate GPS unit. Contact your cooperating fertilizer retailer about persons equipped to do geo referencing.
- The minimum information that generally needs to be recorded is found on the field information sheet.
  - Plat maps with field highlighted; road and closest crossroads are helpful.

If possible, pictures should be taken and submitted of the tillage operation in progress as well as the device used to complete the operation. (This will assist in the analysis of the plot if questions arise as to the conditions of the plot.)