FINAL REPORT
LEPF Grant - 2005
DUE July 31, 2004

TITLE
Securing Quality Data Using Farmer Clusters and Summer Interns

Project Sponsor
Conservation Action Project
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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 Commision 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 Boncke, Napoleon, Roger Bennett, Edon, Larry Buschhoff, 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 Osborne, Edon; Robet Rettig, Napoleon;
Richard Vorwerk, Napoleon; Mark Wahrmann, 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 Rencich.

Consultants
Agricultural consultants provided services, advice and knowledge to farmer clients and to CAP.
Nester Ag Management, Joe Nester, Owner
Agronomy First Consulting Services, Tam 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
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 tillied 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 tillied 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 Cause 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 Wasteshed 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: AceWay, DMI Nutriplace, Dynadrive, DynaMaster, Krauss Land Savor, 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 s-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 360 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 - 5 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 differences
- 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 generated by the 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 Benefits

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.

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 to 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. Unexpected 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 pinpointed 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% to 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 Nutriplanter, the Progressive and the Remlinger strip tillage tools, the JD 550 Mulch Master and ActWay 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 Shaumee 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

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<th>Activity</th>
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<tr>
<td>1. Formed Five Farmer Clusters</td>
<td>9/01</td>
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<tr>
<td>2. Determined and designed demonstrations to be conducted</td>
<td>4/02 &amp; 4/03</td>
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<td>3. Select two summer interns to conduct field evaluations</td>
<td>6/02</td>
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<tr>
<td>4. Began field inspections</td>
<td>9-12/02-12/03</td>
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<td>5. Conducted fall strip tillage</td>
<td>6/02-9/03</td>
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<td>6. Conducted soil compaction, weed control tests</td>
<td>9-12/02-12/03</td>
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<tr>
<td>7. Harvested plots, make yield comparisons</td>
<td>1/02-12/03</td>
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<tr>
<td>8. Conducted 1 field day, 3 clinics, 6 presentations, 5 special meetings</td>
<td>9/01-12/03</td>
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<tr>
<td>9. Collected and analyzed data from two harvest seasons</td>
<td>7/04</td>
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<tr>
<td>10. Summarized and published final report</td>
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</tbody>
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Collaborating With Agencies And Individuals
The following persons were contacted and were involved in the project:
- STATE - ODNR - Edward Crawford, Program Specialist 419-424-5006 technical assistance
  - OSU Extension - Reza Elsani, 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
- 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 is noted on each side of the road. Over 300 stops are made providing an accurate measurement of the amount 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 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 adds this amount, but the numbers and skill in the use of yield monitors and global positioning is growing.

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 Retig, Dick Vorwerk, Larry Bischoff, Kevin Homan, Todd Hesterman, Larry Wendt, Mike Benezek, Art Michaels, Ron Cookes, Dan Durham, Dan Meyer, Brent Osborn, Roger Bennett, Tony Disbro, Randy Coles, Jodi Osborn, Gary Oberlin, Tom Badenhop, Davis Farm Service, Liberty Center, Paul Martin & Sons, Gerald, Chris Bonner, Gerald Grain Center, Ridgeville Cmrs, 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: 68.2
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, Zn.
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 Horset, 1qt, Attez Insecticide
Applied: Lorban

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 Jun, (6.5/10 inch)
30-Jun, (4.10 inch) 10-Jul, (18/8/10 inches)
22-Jul, (8/10 inch) 6-Aug, (2/8/10 inches)
14-Aug., (3/10 inch)

YIELD DATA:

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<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
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<tbody>
<tr>
<td>Strip-till wheat Stubble</td>
<td>201.18 bpa</td>
<td>19.5%</td>
</tr>
<tr>
<td>Stale Seedbed</td>
<td>197.9 bpa</td>
<td>18.9%</td>
</tr>
</tbody>
</table>

* 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 JHB23 Pioneer
Seeding Rate 30,000 seeds/acre 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, Zine 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 Primine, 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, (1.4/10 inches) 6-August, (4/6/10 inches)
15-August, (1 inch)

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<tr>
<td>Strip-till Wheat Stubble</td>
<td>192bu/A</td>
<td>18.9%</td>
</tr>
<tr>
<td>Strip-till Soybean Stubble</td>
<td>178bu/A</td>
<td>17.1%</td>
</tr>
</tbody>
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* 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 YYP 214
Seeding Rate 33,000 plants/acre
Planter Used JD 1760
Planting depth 1.2 inches
Year 2002 Crop Soybeans
Fall Tillage Strip-till Spring Tillage No-till
Average Population: 30,000 plants/acre
Percent Emergence: 50.9%

Fertility Program:
Fertilizer Applied: (Fall) (Strip-till) no fertilizer, (no-till) 200# Potash broadcast
Start: 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: 7-June, (1/2 inch)
18-June, (1.2/10 inches) 11-July, (2 inches)
6-August, (48/4/10 inches) 8-August, (1/2 inch)
11-August, (1/2 inch)

YIELD DATA:

<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strip-till Soybean Stubble</td>
<td>5940/b/A</td>
<td>16.1%</td>
</tr>
<tr>
<td>No-till Soybean Stubble</td>
<td>5880/b/A</td>
<td>16.9%</td>
</tr>
<tr>
<td>Row Cleaner Soybean Stubble</td>
<td>5810/b/A</td>
<td>16.7%</td>
</tr>
</tbody>
</table>

PAGE 11
Farm: Verwek  
County: Henry

Plot Type: Replicated Nitrogen Trial

**Plunging/Tillage Information:**
Crop: Cow Date Planted: April 29th Variety: HW 333
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: 95.7%

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

**Herbicide/Insecticide Program:**
Post-emerge: (Alphane) Quadris, Till, Warrior

**Harvest Data:**
Combine Used: JD 9500 stx
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, (1.8/2.10 inches)
11 July, (2 inches)
6 August, (0.4/10 inches)
11 August, (1 inch)

**Yield Data:**

<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Rate</td>
<td>6518lb/A</td>
<td>16.5%</td>
</tr>
<tr>
<td>-10% Rate</td>
<td>6485lb/A</td>
<td>16.4%</td>
</tr>
<tr>
<td>-20% Rate</td>
<td>6423lb/A</td>
<td>16.2%</td>
</tr>
<tr>
<td>-10%</td>
<td>6449lb/A</td>
<td>16.5%</td>
</tr>
<tr>
<td>Full Rate</td>
<td>6355lb/A</td>
<td>16.7%</td>
</tr>
<tr>
<td>-20%</td>
<td>6299lb/A</td>
<td>16.5%</td>
</tr>
<tr>
<td>-20%</td>
<td>6340lb/A</td>
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<tr>
<td>-10%</td>
<td>6372lb/A</td>
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<td>Full Rate</td>
<td>6373lb/A</td>
<td>16.7%</td>
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<tr>
<td>Full Rate</td>
<td>6448lb/A</td>
<td>16.5%</td>
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<tr>
<td>-20%</td>
<td>6429lb/A</td>
<td>16.3%</td>
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<tr>
<td>-10%</td>
<td>6435lb/A</td>
<td>16.4%</td>
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<tr>
<td>Average Full Rate</td>
<td>6423.5lb/A</td>
<td>16.6%</td>
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<tr>
<td>Average 10% Rate</td>
<td>6435.25lb/A</td>
<td>16.48%</td>
</tr>
<tr>
<td>Average 20% Rate</td>
<td>6373.25lb/A</td>
<td>16.35%</td>
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---

Farm: Verwek  
County: Henry

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

**Plunging/Tillage Information:**
Crop: Pococorn Date Planted: 5/29/03
Variety: R 128Y1H
Seeding Rate: 30,000 plants/acre
Planter Used: JD 1770 Vac
Year 2002 Crop: Soybeans
Soybeans/Acre 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: 98.6%

**Fertility Program:**
Fertilizer Applied: (Fall) Strip-till: 20# 0-0-60, 52# 18-46-0, 110# Sulfur 90%, 5# Zinc 36%
22# 82-0-0, 1QT N-Source
Starter: On planter conventional-till, 2# 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: 2# Biscop
Post-emerge: Spot spray, Buctril 1pt/acre
Insecticide Applied: Capture 5.1oz/acre

**Harvest Data:**
Date Harvested: 10/11/03
Combine Used: JD 9500
Yield Monitor Used: Greenstar
Average Ear Count: 28.30 stalks
% Stalks w/ Ears: > 95%

**Rainfall Amounts and Dates:**
6-16 June, (8/10 inches)
23 June, (1.2 inch)
10 July, (2.1/10 inches)
31 July, (2.0/10 inches)
6 August, (3.4/10 inches)

**Yield Data:**

<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strip-till Soybean Stubble: 5965lb/A</td>
<td>18.7%</td>
<td></td>
</tr>
<tr>
<td>Disc Strip-till Soybean Stubble: 6115lb/A</td>
<td>17.8%</td>
<td></td>
</tr>
<tr>
<td>Conventional till</td>
<td>5465lb/A</td>
<td>17.9%</td>
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</tbody>
</table>
### 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: Ty's No-till Drill
- Year 2002 Crop Corn
- Acres in plot site: 20 acres
- Fall Tillage: none, Spring Tillage: AerWay
- Population: 189,000 plants/acre
- Percent Emergence: 94.5%

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

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

**Harvest Data:**
- Date Harvested: 10/7/03
- Combine Used: Cleer x L2
- Yield Monitor Used: Field Star

**Rainfall Amounts and Dates:**
- 2-June, (7/10 inch)
- 16-June, (6/10 inch)
- 23-June, (2/10 inch)
- 10-July, (2.75 inches)
- 31-July, (18/10 inches)
- 6-August, (2 inches)

**YIELD DATA:**

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<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
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<tbody>
<tr>
<td>No-till 1</td>
<td>44.2 bpa</td>
<td>11.4%</td>
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<tr>
<td>AerWay 1</td>
<td>41.6 bpa</td>
<td>11.2%</td>
</tr>
<tr>
<td>AerWay 2</td>
<td>42.9 bpa</td>
<td>11.2%</td>
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<tr>
<td>No-till 2</td>
<td>39.92 bpa</td>
<td>11.6%</td>
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<td>No-till 3</td>
<td>40.3 bpa</td>
<td>11.4%</td>
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<tr>
<td>AerWay 3</td>
<td>39.9 bpa</td>
<td>11.5%</td>
</tr>
<tr>
<td>AerWay 4</td>
<td>39.7 bpa</td>
<td>11.0%</td>
</tr>
<tr>
<td>No-till 4</td>
<td>37.6 bpa</td>
<td>11.4%</td>
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</tbody>
</table>

Average AerWay | 41.03 bpa | 11.23% |
Average No-till | 40.51 bpa | 11.45% |

---

### Farm: Hesterman  County: Henry

**Plot Type Replicated AerWay vs. No-till Soybeans**

**Planting/Tillage Information:**
- Crop: Soybeans, Variety: 93B882 Pioneer
- Seeding Rate: 225,000 plants/A
- Planter Used: JD 750 Drill
- Year 2002 Crop Corn
- Acres in plot site: 20 acres
- Fall Tillage: none, Spring Tillage: AerWay
- Average Population: 187,025 plants/acre

**Fertility Program:**
- Fertilizer Applied: none

**Herbicide/Insecticide Program:**
- Pre-emerge: Conquest 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)
- 8-June, (1.4/10 inches)
- 11-July, (26/10 inches)
- 6-August, (5 inches)
- 11-August, (3/10 inch)

**YIELD DATA:**

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<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
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</thead>
<tbody>
<tr>
<td>AerWay 1</td>
<td>47.63 bpa</td>
<td>12.9%</td>
</tr>
<tr>
<td>No-till 1</td>
<td>46.79 bpa</td>
<td>12.7%</td>
</tr>
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<td>AerWay 2</td>
<td>46.05 bpa</td>
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<tr>
<td>No-till 2</td>
<td>45.74 bpa</td>
<td>12.8%</td>
</tr>
<tr>
<td>AerWay 3</td>
<td>46.43 bpa</td>
<td>12.7%</td>
</tr>
<tr>
<td>No-till 3</td>
<td>45.61 bpa</td>
<td>12.6%</td>
</tr>
<tr>
<td>AerWay 4</td>
<td>46.01 bpa</td>
<td>12.7%</td>
</tr>
<tr>
<td>No-till 4</td>
<td>43.83 bpa</td>
<td>12.9%</td>
</tr>
</tbody>
</table>

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 93867 treated
- Seeding Rate 195,000 plants/acre
- Planter Used Henken 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: 96%

**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)
- 12-Jun. (1/2 inch)
- 23-Jun. (4/10 inch)
- 10-July. (1/6/10 inch)
- 1-July. (2/3/10 inches)
- 6-August, (3 inches)

**YIELD DATA:**

<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>AerWay Soybeans</td>
<td>42.3 bpa</td>
<td>15.04%</td>
</tr>
<tr>
<td>No-till Soybeans</td>
<td>42.0 bpa</td>
<td>15.04%</td>
</tr>
<tr>
<td>Disk Stalks Soybeans</td>
<td>41.25 bpa</td>
<td>15.04%</td>
</tr>
</tbody>
</table>

---

**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 21-9-0 with Sulfur and Zinc
- Side-dress: Anhydrous Ammonia, 140# actual
- Total N Applied: 194# actual

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

**Harvest Data:**
- Ave. Ear Count: 29.2/10 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, (3/8/10 inches)
- 12-August. (1/2/10 inches)

**YIELD DATA:**

<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum-till</td>
<td>191.4 bpa</td>
<td>21.1%</td>
</tr>
<tr>
<td>No-till</td>
<td>190.3 bpa</td>
<td>21.7%</td>
</tr>
<tr>
<td>Minimum-till</td>
<td>199.6 bpa</td>
<td>21.4%</td>
</tr>
<tr>
<td>No-till</td>
<td>187.8 bpa</td>
<td>21.4%</td>
</tr>
<tr>
<td>Minimum-till</td>
<td>198.6 bpa</td>
<td>21.1%</td>
</tr>
</tbody>
</table>

Average No-till: 189.05 bpa, 21.55%
Average Minimum till: 196.53 bpa, 21.2%
Farm Michaels  County Henry

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

Planting/Tillage Information:
Crop Corn; Date Planted 5-23-01 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: 11/17/02
Combine Used JD 7720
Yield Measure Used Weigh Wagon
Rainfall Amounts and Dates:
24-June (14.2/10 inches)
10-July (9.6/10 inches)
6-August, (48.6/10 inches)
12-August, (7/10 inch)

YIELD DATA:
<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum-till</td>
<td>177.43 bpa</td>
<td>22.3%</td>
</tr>
<tr>
<td>No-till</td>
<td>177.59 bpa</td>
<td>22.3%</td>
</tr>
</tbody>
</table>

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 20,000 plants/acre
Planter Used JD 900 Planting depth 1.75 inches
Year 2002 Crop Soybeans Acres in plot site 20 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: Bispell II Magnum
Post-emerge: Diuron, 40g

Harvest Data:
Ave. Ear Count: 29.5/0 stalks
9% stalks w/ Ears: 98.3%
Rainfall Amounts and Dates:
3-June, (7.10 inch) 11-June, (3.5/10 inch)
24-June, (1 inch) 16-July, (3.6/10 inch)
6-August, (3.5 inches) 12-August, (9/10 inch)

YIELD DATA:
<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum-till</td>
<td>195.73 bpa</td>
<td>19.24%</td>
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<tr>
<td>Deep-till</td>
<td>199.85 bpa</td>
<td>19.00%</td>
</tr>
<tr>
<td>Deep-till</td>
<td>199.12 bpa</td>
<td>19.00%</td>
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<tr>
<td>Minimum-till</td>
<td>189.70 bpa</td>
<td>19.13%</td>
</tr>
<tr>
<td>Minimum-till</td>
<td>191.86 bpa</td>
<td>19.60%</td>
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<tr>
<td>Deep-till</td>
<td>197.23 bpa</td>
<td>19.58%</td>
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<tr>
<td>Deep-till</td>
<td>199.88 bpa</td>
<td>19.71%</td>
</tr>
<tr>
<td>Minimum-till</td>
<td>199.61 bpa</td>
<td>19.52%</td>
</tr>
<tr>
<td>Average Deep-till</td>
<td>199.02 bpa</td>
<td>19.25%</td>
</tr>
<tr>
<td>Average Minimum-till</td>
<td>194.20 bpa</td>
<td>19.46%</td>
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</tbody>
</table>
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-till, dry starter and 200 lbs 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: 27,330 stalks
% Stalks w/ Ear: 92%

Rainfall Amounts and Dates:
1-June, (5.5/10 inch) 11-June, (2.10 inch) 23-June, (8.10 inch)
19-July, (2 inches) 31-July, (1.4/10 inches)
6-August, (1.7/10 inches) 12-August, (6.10 inch)

YIELD DATA:
<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strip-till, Regular</td>
<td>193 bpa</td>
<td>17.5%</td>
</tr>
<tr>
<td>Strip-till, with Sub-till</td>
<td>228 bpa</td>
<td>18.6%</td>
</tr>
</tbody>
</table>

* 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: 96%

Fertility Program:
Fertilizer Applied: (Strip-till) (Fall) 24% 0-29-22, 185 units NH₃, 18 Zinc, 4# Sulfur,
(No-till) (Spring) 24% 0-29-22
Starter: (Strip-till) 15 gal, 26-0-0, (No-till) 30 gal, 17-16-0, 1# Zinc, 4# Sulfur
Side-dress and Type used: (Strip-till), None,
(No-till), 40 gal 28%
Total N Applied: (Strip-till), 224 units, (No-till), 196 units

Herbicide/Insecticide Program:
Pre-emerge: Bicep, Simazine, 3-4-D

Harvest Data:
Combine Used: JD 9500
Yield Monitor Used: Greenstar
Ave. Ear Count: 29,200 stalks
% Stalks w/ Ear: 97.3%

Rainfall Amounts and Dates:
2-June, (1.1/0 inch) 19-June, (1.8/10 inches) 30-June, (5.5/10 inch)
11-July, (2 & 2/10 inches) 22-July, (1 inch)
6-August, (3.8/10 inches)

YIELD DATA:
<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strip-till</td>
<td>221.26 bpa</td>
<td>n/a</td>
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<tr>
<td>No-till</td>
<td>216.98 bpa</td>
<td>n/a</td>
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<tr>
<td>Plot Type</td>
<td>S-H-S, Strip-till wheat stubble vs. Strip-till stale Seedbed</td>
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<tr>
<td>-----------</td>
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<tr>
<td><strong>Planting/Tillage Information:</strong></td>
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<tr>
<td>Crop: Corn</td>
<td>Date Planted: 4/26/03</td>
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<tr>
<td>Variety: Pioneer 34-M-95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seeding Rate: 21,000 plants/acre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planter Used: JD 7000</td>
<td>Planting depth: 1.5 inches</td>
<td></td>
</tr>
<tr>
<td>Year: 2002 Crop Wheat</td>
<td>Acres in plot site: 50 acres</td>
<td></td>
</tr>
<tr>
<td>Fall Tillage: Strip-till</td>
<td>Spring Tillage: None</td>
<td></td>
</tr>
<tr>
<td>Average Population: 30,000 plants/acre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Emergence: 98.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fertility Program:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertilizer Applied: 245# 0-20-22, 185 units NH₃</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Starter: 12gal, 26-0-0, 18 Zinc, 4# Sulfate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Side-dress: None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total N Applied: 224 units</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Herbicide Program:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-emerge: Bicep, Simazine, 2.4-D</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Harvest Data:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date Harvested: 10/30/03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combine Used: JD 9510</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yield Monitor Used: Greenstar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Ear Count: 29.5/30 stalks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Stalks w/ Ears: 98.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rainfall Amounts and Dates:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-June: (1/10 inch)</td>
<td>19-June: (1/2 inch)</td>
<td>30-June: (1/2 inch)</td>
</tr>
</tbody>
</table>

| **YIELD DATA:** | | | |
|-----------------|-----------------|-----------------|
| Practice | Yield | Moisture |
| Strip-till wheat Stubble | 222.24 bpa | n/a |
| Strip-till in Stale Seedbed | 217.95 bpa | n/a |

**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 1553BTS | Seeding Rate: 30,000
Planter Used: JD 7000 | Planting depth: 1.75 inches
Year: 2002 Crop Soybeans | Tillage: Strip-till
Spring Tillage: No-till
Average Population: 28,000 plants/acre
Percent Emergence: 91.8%

**Fertility Program:**
Starter: 1800 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: 92.3%

**Rainfall Amounts and Dates:**
19-June: (1.4/10 inch) | 30-June: (4/10 inch) | 11-July: (2 inches) | 22-July: (1 inch) | 6-August: (4/10 inch) | 15-August: (8/10 inch)

**YIELD DATA:**
<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strip-till w/ Dry Fertilizer</td>
<td>175.0 bpa</td>
<td>19.0%</td>
</tr>
<tr>
<td>Strip-till w/o Dry Fertilizer</td>
<td>169.0 bpa</td>
<td>21.0%</td>
</tr>
</tbody>
</table>
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 33Y94 Seeding Rate: 38,000
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 lbs. 9-41-0/Zinc sulfate. 200#: 0-0-60 in fall
Side-dress and Type used: 60 gal 28%
N Applied: 200#

Herbicide/Insecticide Program:
Pre-emergent: Field Master

Harvest Data:
Date Harvested: 11/2/2003
Combine Used: JD 7720
Average Ear Count: 27.5/30 stalks
% Stalks w/Ear: 92%

Rainfall Amounts and Dates:
17-June, (1/8") 25-June, (2.1/10"
15-July, (3.5"
24-July, (1.8") 14-August, (3.5"

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 20
Fall Tillage: Finishing tool, Strip-till
Spring Tillage: none
Average Population: 25,000 plants/acre
Percent Emergence: 92%

Fertility Program:
Fertilizer Applied: 200lbs. 0-0-60, 50lbs. 11-52-0
Starters: 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-emergent: Round Up
Insecticide Applied: none.

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

Rainfall Amounts and Dates:
15-July, (2.6") 24-July, (1"
14-August, (3.5"

YIELD DATA:
Practice        Yield     Moisture
Strip-till Stale Seedbed 183 bpa   19%
No-till Stale Seedbed 180 bpa   19%
Farms: 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 1
Variety: Brodock SX819
Seeding Rate: 27,500 plants/acre
Planter Used: 660 White, six row
Planting depth: 1.5 in.
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: 99.2%

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: 2.6qt Harness Extra 5.6
Insecticide Applied: Ae Lorabai 1.2g

Harvest Data:
Date Harvested: Dec. 4
Ave Ear Count: 29/30 stalks
% Stalks w/ Ears: 98.5%

Rainfall Amounts and Dates: 15 July (3 inches)
24 July (1 inch) 14 Aug. (0.5 inches)

YIELD DATA:
Practice  Yield  Moisture
Strip-till wheat stubble  172 bpa  19.9%
No-till wheat stubble  175.7 bpa  19.6%

2002 Farm Cluster Plot Data

Farms: Wachtman

Equipment: Remlinger Strip Tiller
2001 Crop: Soybeans 2002 Crop: Corn
Date Planted: 5/1/02  Planting Rate: 30,000
Variety: 34B23, 34N16
Fall Tillage: 11/27/01 Strip Tilled
Fertilizer Applied: 12.5# 8-2-0, 15# 0-0-60, 80# 11-52-0, 5# Zinc, 5# Manganese, 90 qts N-serve
Nitrogen Applied: 6/12/02 90# 82-0-0
Herbicide: 5/31/02 1 qt Princep 4L/ SB Oil, 1 qt Roundup
- 6/12/02 1.5 qt Atrazine 4L/1 pt. SB Oil

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

2001 Crop: Wheat 2002 Crop: Corn
Date Planted: 5/1/02  Planting Rate: 30,000
Variety: 34B23, L.G. 34B24, 33T90
Fall Tillage: 11/27/01 Strip Tilled
Fertilizer Applied: 155# 82-0-0, 150# 0-0-60, 80# 11-52-0, 5# Zinc, lgt. N-serve
Herbicide: 4/26/02 1 qt Princep 4L/1 pt. Soybean Oil, 1/2 pt Roundup, 1/5 qt Atrazine 4L/1 pt Soybean Oil, 2 oz Horsetail

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** – Reimlinger Strip Tiller

2001 Crop – Corn  
2002 Crop – Corn

**Date Planted** 5/5/02  
**Planting Rate** 30,000

**Variety** P223

**Fall Tillage** – 11/23/01 Strip Tilled

**Strip Till Plot**

- **Fertilizer Applied** – 200# 0-0-0, 50# 11-52-0, 5# Zinc, 5# Manganese  
  - 5/5/02, 16# 12-20-4 in planter

- **Nitrogen Applied** – 210# 82-0-0, 8 qt. N-serve  
  - 6/9/02 8 oz. Clarity + ½ gal 28%

**Conventional Tillage Plot**

- **Fertilizer Applied** – 200# 0-0-0, 50# 11-52-0, 5# Zinc, 5# Manganese  
  - 5/5/02, 16# 12-20-4 in planter

- **Nitrogen Applied** – 180# 82-0-0 Side dressed  
  - 6/9/02 8 oz. Clarity + ½ gal 28%

**YIELD DATA:**

<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strip till Popcorn</td>
<td>3705 ppa</td>
</tr>
<tr>
<td>Conventional Tillage Popcorn</td>
<td>3537 ppa</td>
</tr>
<tr>
<td>Strip Till Popcorn</td>
<td>3631 ppa</td>
</tr>
<tr>
<td>Conventional Tillage Popcorn</td>
<td>3472 ppa</td>
</tr>
</tbody>
</table>

**Farm: Homan**

**Equipment** – AerWay

2001 Crop – Corn  
2002 Crop – Soybeans

**Date Planted** 5/5/02  
**Seeding Rate** 210,000

**Planter** Tyer Drill & White Planter

**Fall Tillage** – AerWay/Disk/Chisel Plow  
**Herbicide** – Pre-emergent - Roundup 2, 4-D  
**Post Emergent** – Roundup

**Date Harvested** – 10/11/02  
**Field Yield** 63 bpa

<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>AerWay</td>
<td>57 bpa</td>
</tr>
<tr>
<td>Fall AerWay</td>
<td>65-67 bpa</td>
</tr>
<tr>
<td>Fall Chisel (30” Rows)</td>
<td>61 bpa</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>AerWay</td>
<td>61.89 bpa</td>
</tr>
<tr>
<td>No-Till</td>
<td>61.22 bpa</td>
</tr>
<tr>
<td>AerWay</td>
<td>61.56 bpa</td>
</tr>
<tr>
<td>No-Till</td>
<td>58.85 bpa</td>
</tr>
<tr>
<td>AerWay</td>
<td>65.04 bpa</td>
</tr>
<tr>
<td>No-Till</td>
<td>63.85 bpa</td>
</tr>
<tr>
<td>AerWay</td>
<td>62.95 bpa</td>
</tr>
<tr>
<td>No-Till</td>
<td>60.04 bpa</td>
</tr>
</tbody>
</table>

**Farm: Bischoff**

**Equipment** – AerWay Residue Manager

2001 Crop – Corn  
2002 Crop – Soybeans

**Variety** – Welman 3236  
**Spring Tillage** – AerWay

**Date Planted** 5/27/02  
**Seeding Rate** 215,000

**Planter** Tyer 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%

<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>No-Till</td>
<td>49.35 bpa</td>
<td>12.0%</td>
</tr>
<tr>
<td>AerWay</td>
<td>56.74 bpa</td>
<td>12.1%</td>
</tr>
<tr>
<td>AerWay</td>
<td>58.15 bpa</td>
<td>12.2%</td>
</tr>
<tr>
<td>No-Till</td>
<td>61.85 bpa</td>
<td>12.4%</td>
</tr>
<tr>
<td>No-Till</td>
<td>59.13 bpa</td>
<td>13.0%</td>
</tr>
<tr>
<td>AerWay</td>
<td>44.13 bpa</td>
<td>12.3%</td>
</tr>
<tr>
<td>AerWay</td>
<td>45.22 bpa</td>
<td>12.6%</td>
</tr>
<tr>
<td>No-Till</td>
<td>48.26 bpa</td>
<td>13.1%</td>
</tr>
</tbody>
</table>
Farm: Osborn
Equipment – DMI Nutriplacer
2001 Crop – Soybeans 2002 Crop – Corn
Variety Pioneer Date Planted – 5/28/02 Seeding
Rate – 27,500
Fertilizer Applied – 200# 9-41-9/Zn in Row Starter; 150# 0-0-60
Nitrogen Applied 148# 82-0-0  Herbicide – Hornet

YIELD DATA:

<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional-Till</td>
<td>57.61 bpa</td>
<td>21.1%</td>
</tr>
<tr>
<td>Strip-Tillage</td>
<td>72.42 bpa</td>
<td>19.3%</td>
</tr>
<tr>
<td>Conventional-Till</td>
<td>69.04 bpa</td>
<td>19.7%</td>
</tr>
<tr>
<td>Strip-Tillage</td>
<td>76.17 bpa</td>
<td>19.2%</td>
</tr>
<tr>
<td>Conventional-Till</td>
<td>46.46 bpa</td>
<td>20.8%</td>
</tr>
<tr>
<td>Strip-Tillage</td>
<td>77.56 bpa</td>
<td>18.3%</td>
</tr>
</tbody>
</table>

Farm: Oberlin
Equipment – DMI Nutriplacer
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:

<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strip-Till</td>
<td>104.71 bpa</td>
<td>16.3%</td>
</tr>
<tr>
<td>No-Till</td>
<td>86.42 bpa</td>
<td>15.1%</td>
</tr>
<tr>
<td>Conventional-Till</td>
<td>76.71 bpa</td>
<td>15.7%</td>
</tr>
</tbody>
</table>

Farm: Coles
Equipment – DMI Nutriplacer
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:

<table>
<thead>
<tr>
<th>Practice</th>
<th>Yield</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strip-Till</td>
<td>70.43 bpa</td>
<td>15.7%</td>
</tr>
<tr>
<td>No-Till</td>
<td>58.76 bpa</td>
<td>15.7%</td>
</tr>
</tbody>
</table>

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

General Information: Farm ____________________________ Plot Type ____________________________

Planting/Tillage Information:
Crop ____________________________ Date Planted ____________________________ Variety ____________________________
Seedling Rate ____________________________ Planter Used ____________________________ Year 2001 Crop ____________________________
Fall Tillage ____________________________ Date Completed ____________________________
Spring Tillage ____________________________ Date Completed ____________________________

Fertility Program:
Fertilization Program ____________________________
Nitrogen Applied __________________________________ 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: ____________________________
General Comments or Irregular Events: ____________________________
GUIDELINE FOR RESIDUE MANAGEMENT DEMONSTRATION

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 Neater (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: - Plot maps with field highlighted, road and closest crossroads are helpful.

Page 23
GUIDELINES FOR NITROGEN DEMONSTRATIONS

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 specific 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**

<table>
<thead>
<tr>
<th>Zone</th>
<th>Rate</th>
<th>Total N Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10% less than full rate</td>
<td>193.5# (215# x 10% = 21.5# less N)</td>
</tr>
<tr>
<td>B</td>
<td>10% less than full rate</td>
<td>193.5# (215# x 10% = 21.5# less N)</td>
</tr>
<tr>
<td>C</td>
<td>20% less than full rate</td>
<td>172# (215# x 20% = 43# less N)</td>
</tr>
</tbody>
</table>

**Border Design**

- Randomized Replicated Design For Soil Test Prior To Side Dress Application

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.

- Plot 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.)