“Making the Nitrogen Fall in Season”

Final Report
Agreement Number 3191511

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I. Project Background:

This grant was applied for as the result of the Watershed Plan for the Salt Fork River that was generated in response to water quality issues related to the introduction of nutrients into the watershed from the extensive agricultural activities in the watershed. Row crop production and its associated nutrient applications along with the fertility levels of nutrients naturally occurring in the soil provide a source of nutrients to our surface waters. The Champaign County Soil and Water Conservation District (CCSWCD) Board and its Salt Fork Committee set a water quality priority to address these concerns. This project was designed to address the issue in a way that was profitable for farmers and addressed the nutrient issues that impacted local drainage ditches, streams and rivers.

Nutrients move off fields attached to soil particles and dissolved in the water running off the fields and in tile water moving into the rivers and streams. Nitrogen and phosphorus are concerns. The area of focus was the Salt Fork Watershed (hucs 0512010902, 0512010903, and 0512010906), farmers in other areas were also encouraged to participate. The Nutrient Loss Reduction Strategy shows the concerns for nutrient loss in the Mississippi River Watershed.

II. Plan of implementation:

1. Method for making specialized equipment (i.e. side dress tillage bars and strip-till units) available for producers.
    a. Equipment for side dressing nitrogen and for placing other nutrients in strips are in the market place across the nation. However, few dealers with this equipment are located in Central Illinois. This equipment tends to be specialized and have a large price tag. This grant will allow a farmer to locate a source of equipment that will work best for their operation. Once the farmer has purchased the equipment the grant will then lease the equipment from the farmer for the year. With this part of the grant the CCSWCD to lease the equipment the first year for 30% of the cost of the equipment. In the first year we will use 50% of the cost of the equipment and we will pay the producer 60% of this value. The 40% not reimbursed will be used as match for the grant. The CCSWCD will then review the program for the second year and offer a percentage lease based on the funds still available not to exceed 60% of the cost for both years. Example; A bar costing $20,000 would receive $6,000 the first year ($20,000 X 50% X 60%). In year 2 the payment for the producer would be ($20,000 X 50% X % determined by CCSWCD). We base these numbers off of past grants and programs offered by the State of Illinois. We also feel that the farmers portion of the bar cost would be an excellent match. Farmers that sign up and take part in the leasing of equipment are not eligible for the per acre cost share.

2. Process for producers to sign up for participation in the program
    a. The sign up for the program is very simple. Anyone operating in the watershed is eligible for signup in the program. Advertising has been done by letter, newsletter, and word of mouth (which has generated the most sign ups). For participation in the program the office verifies with the use of FSA records that they are farming in the watershed. Participants would then have to provide the office with third party proof that they have purchased equipment and/or have had the service completed on the farms that they are requesting the assistance for.

3. Per cost share rates for each practice offered
    a. A cost share of $5 per acre will be offered to those in the watershed that do side dressing and are not part of the leasing program for the bars. The average custom application rate for side dressing in the watershed is $10 an acre which does not include the fertilizer. This is just the use of the specialized equipment that a few fertilizer dealers make available. Match will be the amount above the $5 per acre that is spent for the practice.
    b. A cost share for cover crops will be paid at 60% of cost not to exceed $15 an acre. This has been found to be the best rate to use in Champaign County. The county average for cover crops is $32 an acre. This year we are seeing an average cost drop due to seed cost reductions and fertilizer companies willing to apply the seed with fertilizer applications. The farmer will need to bring into the office a bill showing the seed used, how it was planted and a site location.
    c. Nutrient Management Plans will be required for the cost share and lease programs. A Nutrient Management plan has been valued at $15 per acre. No cost share will be provided for the plans, as this was considered to be match for the grant.
    d. Strip-till will have a cost share of 60% of cost not to exceed $20 an acre for those wishing to take part in the program. The amount above 60% or $20 an acre will be considered match by the farmer. The farmer will also have a nutrient management plan.
4. Methodology for calculating soil and nutrient loss reductions
    a. The office will use the Illinois Department of Agriculture's RUSLE form to figure up the nutrient and soil savings. This form is very similar to the IEPA's form. The main difference is that the form has been used for cover crop information collecting the past few years, which, will help us with a baseline for information collection. Example, a mulch tillage practice will have a value of 0.30. When you add cover crops you get to reduce the practice by 20% so the after value will be 0.24. This gives the right amount of months that the cover crop practice is actually a value to the land. These are our most common:

i.	Conventional Tillage	0.43	With Cover Crops	0.344
ii.	Mulch Tillage	0.30	With Cover Crops	0.24
iii.	Reduce Tillage	0.18	With Cover Crops	0.144
iv.	Strip-Tillage	0.125	With Cover Crops	0.10
v.	No-Till	0.08	With Cover Crops	0.064

5. Process for promoting this strategy to producers

The process for promoting this strategy is to use our newsletter, annual meeting, additional meetings that are being planned, targeted letters and what we have found to be the best way to improve acceptance of new ideas is word of mouth (one farmer talking to another). We have already had a large sign up with more to come.

III. Project Evaluation and Report:

The biggest success of the grant has been with the post emergence nitrogen application. One of the bars that was leased by this grant was modified to variable rate the nitrogen as it went thru the field. The bar is allowing the farmers a look at this technology for the 2019 growing season. They are learning and working with the current owner to understand what is needed to make this an effective tool. This part of the grant has generated enough demand that three of the fertilizer dealers in the watershed have now invested in more equipment and needed support equipment. This part of the grant is also one that is getting the most request to keep going. We were able to get 34,788 approximate acres with a cost of $16.75 per acre approximately. This would be the average of costs over the three-year grant, which did not raise the average cost of the practice. The grant did increase the demand for the practice. Timing for this part of the grant could not have been chosen any better. We had three years of spring weather that just fit this type of application, combine that with all the news coverage on the Nutrient Loss Reduction Strategy timing was just spot on. The Champaign County Soil and Water Conservation District is very happy to report that a huge demand is requesting that we keep the Side dress cost share program going!

Cover Crops have a number of benefits. They can prevent erosion, improve soil healthy, reduce weed populations and may in time return nutrients to the soil. The CCSWCD is seeing a benefit in both water quality and soil healthy when the land has something growing or protecting it all year around. With that in mind the District is continually working with farmers and land owners to try and get as many acres as possible planted with cover crops. Cover crops were one part of the grant that we struggled on. For cost share and bills turned in for the grant use we only had 7,474 approximate acres. However, our survey that the farmers are filling out each year when they come in to the Farm Service Agencies office show them reporting 7,000 acres by 41 farmers a year for the county. The CCSWCD has been at this number of acres now for several years. We are looking at new ways to get some of our more traditional farmers to begin working with cover crops. What has changed in cover crops is the precedent set by the U of I that the ground cover crops are planted on has a rental rate of $100 per acre. When you add this factor in to the match for cover crops is by far more attractive for the benefits. The acreage rental rate added in the match would be $950,986.41 to a cost of $46,349.23 that would be a 95% match by the farmers. This just adds to the case that cover crops have a great value.

The grant has also showed the office that Strip-till is still the preferred farming method that most farmers would like to use. One of the biggest reasons that farmers are not able to just switch to this method of farming is the cost of the equipment and the tractor horse power needed to make the unit work correctly. The development of the strip-till method of crop field preparation only disturbs a third of the field area leaving untilled strips in the center of the rows that have crop residue to reduce soil erosion by slowing the movement of water off fields and breaking up the power of rain drops hitting the soil surface. The recent development of equipment to inject dry fertilizer into the row in a band 6” deep in the soil moves the phosphorus application off the surface where it is subject to runoff as dissolved phosphorus. Farmers found the banded applications concentrate the fertilizer in the root zone making it more efficient for the plant to take up thus allowing them to reduce application rates for nutrients while maintaining satisfactory yields.

The office is and will continue working on Nutrient Management Plans to the NRCS 590 Standard. Several benefits to having the plans is the knowledge that the farmers are not over applicating and form what we have found thru the grant most are well with in the 10% recommendations of the Nitrogen application. After the application was submitted and awarded the USDA NRCS 590 standard was changed. The CCSWCD office had a method that would only take about 10 to 15 minutes for a nutrient management plan that would meet the standard. When the standard changed, requiring a great deal more mapping the time for each nutrient management plan went up to an hour or more. The CCSWCD has learned over the years that having a person in the watershed, that the farmers trust is the best way to make grants successful. With that said we had Randle set to work on the grant when we unexpectedly lost him. His presences was greatly missed.

IV. Project Statistics

The project accounted for 42,262 acres of application over three years.

A few of the project reductions are listed below=

- **Strip-Till**
  - **Sediment Reduced – 2477.9 T/yr**
  - **N load Reduced 6901 Lbs/yr**
  - **P load reduced 3460 Lbs/yr**
- **Cover Crops**
  - **Sediment Reduced 896 T/yr**
  - **N load reduced 2534 Lbs/yr**
  - **P load reduced 1266 Lbs/yr**

Since farmers will continue using the strip-till and cover crop practices these will be recurring reductions.

V. Positive Outcomes

The project also fostered other practices that improve water quality. The concept of moving from all nitrogen applied in the fall to making several applications, including some after the crop is up was embraced by several dealers who invested in the specialized equipment necessary to make the applications.

The fertilizer industry is moving toward the adoption of the 4R principles for fertilizer application.

1. Right Product
2. Right Placement
3. Right Timing
4. Right Rate

This program is an attempt to address water quality issues. Again it brings attention to thinking about fertilizer application rather than just doing what was done in the past.

The farmers that took part in the grant have had a really positive view of the practices that they tried. With timing and good weather many had success with all of the practices that where tried.