in.gov/isda/ofn

Indiana On-Farm Network® – Nutrient Management

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Director, Division of Soil Conservation

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Grant Agreement #69-3A75-10-129

December 19~~8~~, 2014

Deliverables:

- ✓ Provide training and materials to enable and facilitate pooling of data at the local watershed level and coordinate data management and analysis across watersheds.
- ✓ Provide training and direct assistance for management of group dynamics and farmer participatory learning at the local level.
- ✓ Manage the open data process that will make data results and analysis available to participants and the wider stakeholder community while providing farmer confidentiality.
- ✓ Use aerial imagery and guided stalk sampling on corn fields with targeted watersheds and use grain yield evaluations to an alternative N management practice on corn fields.

- ✓ Assemble aggregate data and evaluate its effectiveness on improving N efficiency for corn.
- ✓ Produce and distribute a new technology and innovative approach fact sheet.
- ✓ Attend at least one NRCS CIG showcase or comparable NRCS event during the period of the agreement.
- ✓ Provide the Natural Resources Conservation Service with quarterly progress reports and a final report outlining all deliverables at the end of the fiscal year.

Indiana On-Farm Network® (Mississippi River Basin*) Engagement Goals and Accomplishments:

Year 1 (9/21/10-9/20/11) 2011 OFN Year
Goal was to engage 25 growers and 75 fields
Accomplishments were 114 growers and 271 fields

Year 2 (9/21/11-9/20/12) 2012 OFN Year
Goal was to engage 35 growers and 105 fields
Accomplishments were 140 growers and 347 fields

Year 3 (9/21/12-9/20/13) 2013 OFN Year
Goal is to engage 50 growers and 150 fields
Accomplishments were 216 growers and 503 fields

Year 4 (Extension 9/21/13-9/20/14) 2014 OFN Year
Accomplishments were 244 growers and 670 fields

**Additional growers and fields engaged within Indiana's portion of the Great Lakes Basin with separate funding sources*

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EXECUTIVE SUMMARY:

The Indiana On-Farm Network® has successfully shown the value of and interest in voluntary, farmer-driven adaptive nutrient management networks in order to improve nutrient efficiency and water quality. The Indiana On-Farm Network® project (hereafter referred to as "Project") addressed the priorities identified for the Mississippi River Basin Conservation Innovation Grant (CIG). The Project introduced tools for producers to assess and overcome risk associated with making changes to nutrient management practices. The Project also introduced the value of peer-to-peer participatory learning to both the participants and the local conservation personnel. Lastly, the Project overcame critical barriers to broader adoption and implementation of effective nutrient management.

The Project's objective within the CIG was to engage three watersheds within the Indiana portion of the Mississippi River Basin. Each watershed's goal was to enroll 40 to 50 fields with 10 to 15 farmers on average. In 2014, the Indiana On-Farm Network® is more than five times larger than expected and includes 22 groups in 19 watersheds within the Mississippi River Basin. On average, each watershed has 12 -18 growers engaged and more than 34 fields enrolled. During the Project, over 142,000 *direct* acres have been evaluated with the On-Farm Network® tools and 264 growers have been introduced to the participatory learning process utilizing knowledge gained to manage tens of thousands of additional *indirect* acres. Furthermore, the Project has successfully engaged growers who do not traditionally participate in conservation activities. Often On-Farm Network® group participants range from conventional growers to 20 plus year no tillers.

The Project's grant was initially for three years, ending in September of 2013, but with unanticipated program savings there was adequate funding to support the Project for an additional year. The Indiana On-Farm Network® requested and received a 12 month extension of their CIG.

Since nitrogen (N) is a major input cost for farmers, the ability to identify and implement strategies to apply N fertilizer (including manure) more efficiently benefits farmers (increase profits) and the environment (less nutrient loss to ground and surface water and the atmosphere.) The willingness of this diverse group of Indiana growers to participate in the program highlights the need for nutrient recommendations to distinguish between time of application, N sources and method of application and provide growers with an accessible way to compare the economic impacts of different practices. The Project's rapid growth was driven by both the grower's demand for access to the program as well as local conservation personnel understanding the benefit of improved nutrient management to the environment.

The major supporters of the On-Farm Network project, the Indiana State Department of Agriculture (ISDA), the Indiana Corn Marketing Council (ICMC), and the Indiana Soybean Alliance (ISA) are committed to continue to offer the program to growers within Indiana and to support the growth of similar programs in other states. At the conclusion of the CIG the On-Farm Network® is on the brink of significant expansion in 2015-2017

with the majority of financial support from ICMC and ISA, Indiana's Corn and Soybean Checkoff organizations.

INTRODUCTION:

The Indiana On-Farm Network® CIG was administered by the Indiana State Department of Agriculture (ISDA) with significant contributions by the Iowa Soybean Association (ISA), the Indiana Corn Marketing Council (ICMC), the Indiana Soybean Alliance (ISA), the Environmental Defense Fund (EDF), and the Indiana Conservation Partnership (ICP) as well as many other partners. The Indiana On-Farm Network® provides participants with a report card on the nitrogen use efficiency for each growing season by documenting quantifiable results from the management data collected combined with stalk sampling and aerial imagery all within corn fields. To ensure the accuracy and reliability of the data collected, the program guides growers with established protocols that are practical to implement.

The Indiana On-Farm Network® CIG began enrolling growers for the 2011 growing season and was completed on September 20, 2014. The Indiana On-Farm Network's® objective within the grant period was to engage three watersheds within the Indiana portion of the Mississippi River Basin. Each watershed's goal was to enroll 40 to 50 fields with 10 to 15 farmers on average. In 2014, the Indiana On-Farm Network® included 22 groups in 19 watersheds within the Mississippi River Basin. On average, each watershed has 12 - 18 growers engaged and more than 34 fields enrolled.

The Indiana On-Farm Network® uses aerial imagery, guided stalk sampling and replicated strip trial testing to monitor nitrogen yield response on participating corn fields. In addition, we conduct meetings, both one-on-one and in small groups, which engage participating producers, potential producers and many key stakeholders (grower organizations, CCA's, state agencies, conservation districts, NRCS state and local staff, regulators and others.) Through these efforts, growers adjust their nutrient management practices on enrolled fields to reach optimum nutrient efficiencies, while laying the foundations for similar improvements on many more acres across Indiana.

ISDA serves as the Project lead in Indiana and as a liaison to ISA, ICMC/ISA and EDF to ensure protocols are followed as local group leaders work with farmers to establish trials, collect in-field data and manage collection of aerial imagery. ISA provides the data analysis. ICMC/ISA acts as a liaison to funding partners. ISDA interacts with NRCS at the state level while EDF plays a lead role in interacting with the NRCS and EPA at the national level. As the CIG grant has drawn to a close, Purdue University's College of Agriculture and Purdue's Center for Commercial Agriculture have been integrated into the Indiana On-Farm Network® to assist in the formation of an advisory council to guide the future of the Project, provide further data analysis, related public facing reports, and social indicator surveys amongst Project participants to quantify behavioral changes related to nutrient management.

ISDA, ICMC/ISA, EDF and ISA collaborate in development and dissemination of communications materials, fact sheets, web publications, media engagement and other

tools for sharing and disseminating information about the project within and beyond those actively engaged in the project. The main role of NRCS in the project was collaboration in the further development and utilization of the technical notes on adaptive management for the 590 Standard for Nutrient Management and leveraging of EQIP through CCPIs for the On-Farm Network®, and interactions with other NRCS programs.

Many partners are engaged in monitoring and evaluating the project through the sharing of project data and analysis, including NRCS, other state agencies, Soil and Water Conservation Districts, grower organizations and others. ISA plays a lead role in tracking the data and presenting the data that was used to monitor the impact of the project – number of farmers and acres enrolled, strip trial results, aerial imagery and guided stalk sampling results, surveys of farmer management behavior changes, aggregate reductions in nitrogen, and related metrics.

Jordan Seger, Indiana State Department of Agriculture, Division of Soil Conservation Director, served as ISDA's project coordinator during the grant period. Mr. Seger oversees field technicians who work directly with private landowners to plan, survey, design, and construct conservation best management practices which provide both economic and environmental benefits. ISDA staff also collaborate directly with the Indiana agricultural industry and Indiana's Soil and Water Conservation Districts to seek out opportunities to incorporate the adoption of innovative conservation methods into regular agricultural practice with the goal of building soil health, environmental benefits, and production efficiencies. Seger grew up in the poultry industry, has worked for the National Park Service in Maine and Alaska where he conducted air and water quality monitoring, fish and wildlife permitting, and salmon fisheries research. Prior to his current position Seger was the ISDA Ag and Environmental Affairs Manager which largely focused on coordinating statewide data sharing networks of farmers to evaluate different management practices. Seger, a graduate of Indiana University, started with ISDA in northwest Indiana as a field technician where he surveyed and designed Farm Bill conservation projects. Mr. Seger has a B.S. in public affairs from Indiana University.

Initially, Dr. Tracy Blackmer, as Director of Research for the Iowa Soybean Association, managed ISA's role in the project. Dr. Blackmer managed ISA's On-Farm Network® for over ten years. Dr. Blackmer has a Ph.D. in agronomy and a long history of developing and managing conservation initiatives and research with growers. For the last two years, Dr. Peter Kyveryga, Operations Manager-Analytics, Iowa Soybean Association has directed ISA's role in the project. For over eight years, he has been directly involved in multifaceted analyses of spatial, imagery, laboratory and management data spanning all years of On-Farm Network® Guided Stalk and Replicated Strip Trial programs. Dr. Kyveryga has a Ph.D. in soil science and soil fertility, and is Technical Editor-Precision Agriculture for the Agronomy Journal of American Society of Agronomy.

At EDF, the lead staff person is Suzy Friedman, Deputy Director for the Center for Conservation Incentives, who has managed EDF's On-Farm Network® in the Chesapeake Bay and Great lakes since 2004 and has extensive experience working

with NRCS, grower organizations, state agencies, conservation districts and other key partners. In addition, Karen Chapman, Regional Director for the Great Lakes for EDF, helped implement the project.

Other key partners in the project included:

- Mike Dunn, Indiana Soybean Alliance and Indiana Corn Marketing Council: outreach, education and engagement of farmers.
- Meg Leader, ISDA, Division of Soil Conservation: outreach, education and oversight of group leaders.
- Dr. Hans Kok, Conservation Cropping Systems Initiative: outreach and education coordination of participating farmers.
- Dan Towery, Ag Conservation Solutions: outreach and education coordination of participating farmers.
- Lisa Holscher, Conservation Cropping Systems Initiative: outreach and education coordination of participating farmers.
- Jennifer Boyle-Warner, Indiana Association of Soil and Water Conservation Districts: outreach and education for conservation district involvement.

The key personnel involved in the project included partners with extensive experience in developing and managing the On-Farm Network® approach, bringing to the table the technical expertise to manage and ensure quality control of in-field work. Other key partners have extensive experience coordinating local and regional partners and developing and disseminating communications materials, conducting trainings for local group leaders and managing budgets. In addition staff from the Indiana Conservation Partnership have been instrumental in implementation of the project.

Status of cost sharing:

Amounts represent the time period of: 9/21/10 – 9/20/14

Indiana Corn Marketing Council Cash Match	=	$100,000.00
Indiana Soybean Alliance Cash Match	=	$50,000.00
Environmental Defense Fund Cash Match	=	$39,125.00
Indiana Corn Marketing Council in kind staff	=	$22,500.00
Indiana Soybean Alliance in kind staff	=	$10,000.00
ISDA in kind staff and resources	=	$200,000.00
Total Cash Match	=	$189,125.00
Total In Kind Match	=	$232,500.00
Grand Total Match	=	$421,625.00

CIG expenses on 9/20/14 = $363,676.05

BACKGROUND:

The On-Farm Network® was developed by the Iowa Soybean Association (ISA) in 2000 to address key challenges in advancing water quality goals in the state related to production agriculture – existing approaches to nutrient management typically relied on generalized information and failed to show farmers how to make conservation pay. In Iowa, the adaptive nutrient management process has shown most growers can reduce their N rate by one-third while maintaining or increasing profitability. This reduction is below NRCS's general guideline for nutrient management, meaning the program is able to generate greater nutrient reductions and water quality benefits than standard nutrient management plans. The On-Farm Network® CIG built on the success of the ISA program to use ISA's proven approach to accelerate water quality improvements from agriculture in Indiana.

Traditional nitrogen (N) fertilizer recommendations seldom distinguish between time of application, N sources, method of application or rainfall, all of which are important factors in managing N, and they do not provide farmers with an accessible way to compare the economic impacts of different practices. Since N is a major input cost for farmers, the ability to identify and implement strategies to apply N fertilizer (including manure) more efficiently benefits farmers (increase profits) and the environment (less nutrient loss to ground and surface water and the atmosphere.)

Through the On-Farm Network®, farmers work in collaboration with their peers and advisors to evaluate nutrient recommendations and make field-specific improvements – adaptive management in real time with documentable benefits. The program increases benefits and impacts by aggregating field data across regions and creating a feedback loop to the farms individually and in aggregate to foster improved environmental and economical efficiencies.

With NRCS support through the CIG, the Indiana On-Farm Network® built and implemented the infrastructure necessary to evaluate and document the on-the-ground nitrogen management efforts and deliver real and measureable improvements that benefit water quality. With the conclusion of the CIG, the program, coordinated by ISDA with the support from the many partner organizations, has the coordination, communications, data management and analysis, partner development and training and feedback structures in place to continue to function and expand in order to enable more producers to assess and overcome perceived risks of changing and improving management practices. With the support of experienced mentors from ISA and the Environmental Defense Fund, the Indiana On-Farm Network® has developed facilitators capable of leading the participatory learning framework needed to deliver effective producer engagement and adoption of adaptive nutrient management.

REVIEW OF METHODS:

Prior to the development of the Iowa Soybean Association's (ISA) On-Farm Network® in 2000, existing approaches to nutrient management typically relied on generalized information. Traditional nitrogen (N) fertilizer recommendations seldom distinguished between time of application, N sources, method of application or rainfall, all of which are important factors in managing N. They also did not provide farmers with an accessible way to compare the economic impacts of different practices. While Iowa's program was very successful and small similar programs had started in other parts of the country, Indiana's growers who wished to efficiently manage their N fertilizer were struggling to balance traditional recommendations with anecdotal stories.

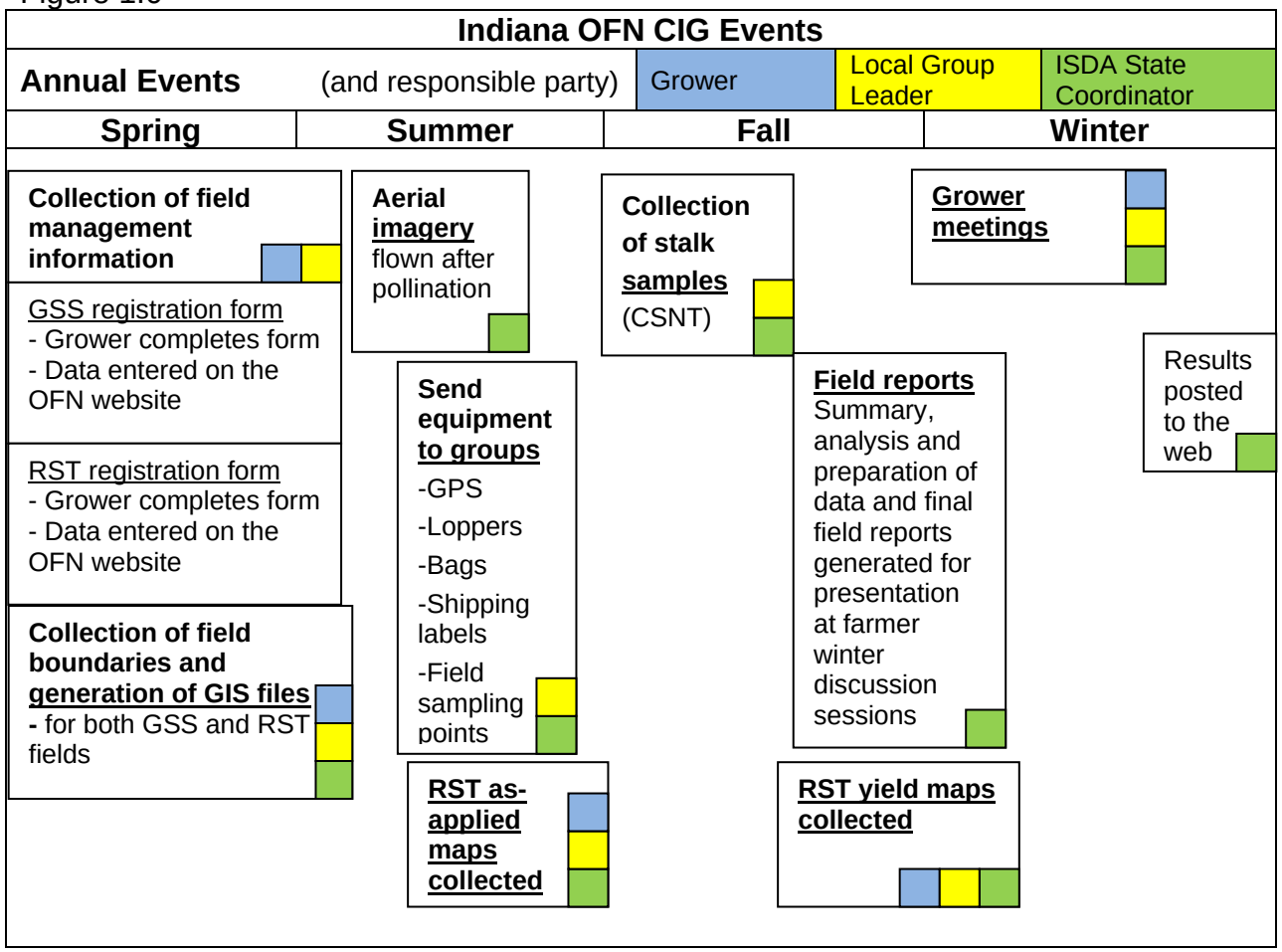
The On-Farm Network® CIG used ISA's proven approach to quickly implement a Indiana state-wide adaptive nutrient management network that was accessible to all interested farmers and where they could make field-specific improvements and receive timely, scientifically-based, feedback to allow them to assess its success or failure– adaptive management in real time with documentable benefits. Farmers work in collaboration with their peers and advisors to evaluate results. Furthermore, the program increased benefits and impacts by aggregating field data across regions thus creating a feedback loop to the farms individually and in aggregate to foster improved environmental and economical efficiencies.

For participating growers, joining the Indiana On-Farm Network® requires very little in the way of initial accommodations. They have to be willing to share the management history of each field they enroll in the program and allow time for all field samples to be collected prior to harvest. They are also required to attend the winter grower group meetings. Farmers who continue to participate in the program will update their management history each year and are expected to compare the different crop yields as their management practices changed from year to year.

The Indiana On-Farm Network® also gives participants the opportunity to study nitrogen efficiency and yield results from different management practices within a field by providing established protocols to follow for on farm evaluations. Farmers who wish to install replicated strip trials receive guidance from their local group leader or the Indiana State Department of Agriculture (ISDA) program coordinator on what is required to ensure the accuracy and reliability of the data collected. Participants are able to compare their normal management practice with an alternative nitrogen application (timing, placement or form) of their choice. Replicated strip trials have to be installed and harvested following the protocols in order to collect statistically significant results.

Over the course of the year, Indiana On-Farm Network® enrolls fields and collects data following a pre-determined schedule. (Figure 1.0)

Figure 1.0

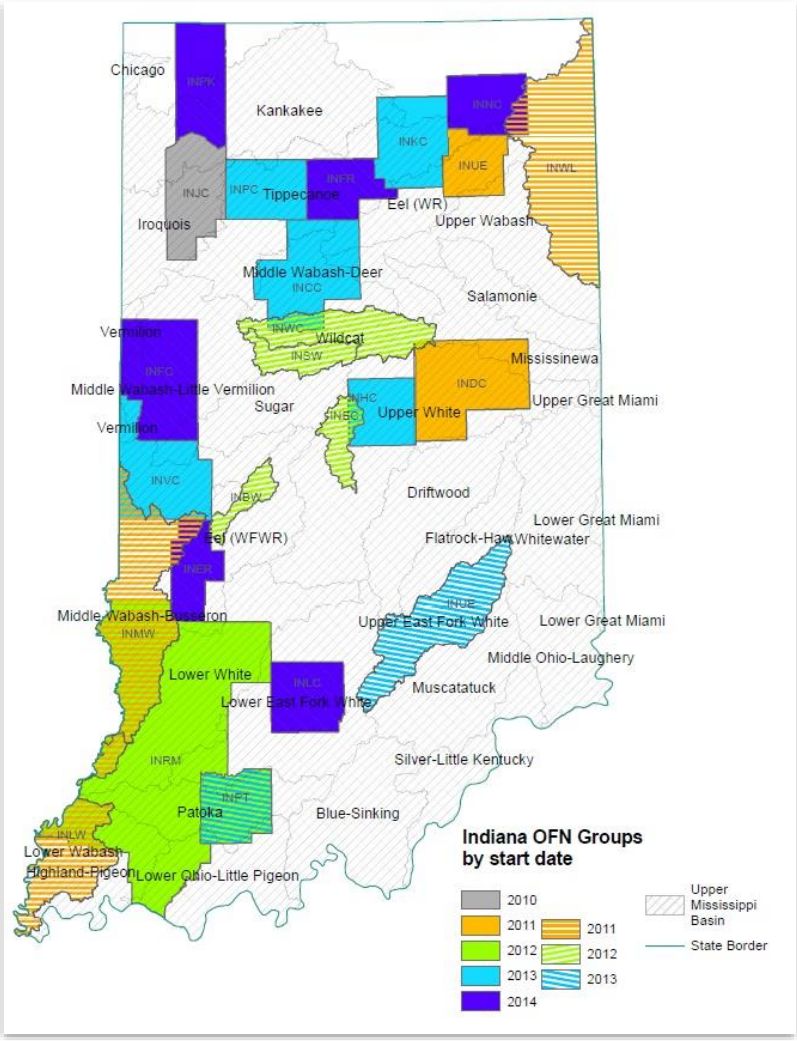


Other Events		
Activity	**Timeframe**	**Duration**
Recruitment of farmers and new groups	Continuous	September 2010 – September 2014
Implementation of extensive communications and outreach strategy targeted at crop consultants, extension and district staff and additional federal and state agency experts. – See Appendix	Continuous	September 2010 – September 2014
Quantification of the benefits of adaptive management and the On-Farm Network® for adoption of new N practices.	Continuous	September 2010 – September 2014
Development of adaptive management fact sheets and technical notes	Continuous	September 2010 – September 2014
Nutrient Management Data Collection & Analysis for Adaptive Management. NRCS Indiana Job Sheet 590. February 2011.		
Semi-annual reports on project progress and activities	December and June	September 2010 – September 2014

Review and analysis of data for publication as fact sheets, updates and articles in scientific and farm publications – See Appendix	Continuous	September 2010 – September 2014

Location of Indiana On-Farm Network® groups and group start dates. (Figure 1.1) Groups outside of the Upper Mississippi Basin were funded outside of the CIG and included for informational purposes only.

Figure 1.1



What portions of the Indiana On-Farm Network® CIG worked well:

- The working partnership between the Indiana State Department of Agriculture, the Iowa Soybean Association, the Indiana Corn Marketing Council/Indiana Soybean Alliance and the Environmental Defense Fund.
- The development of new local groups and the engagement resulting in enrollment of additional growers.

- Training and support of local group leaders so they were comfortable with On-Farm Network's® established protocols and understanding their role in the management of group dynamics and farmer participatory learning.
- The development of facilitators capable of leading the participatory learning process needed to deliver effective producer engagement and adoption of adaptive nutrient management.
- Presenting data results and analysis to both participants and the wider stakeholder community, while protecting farmer confidentiality
- Education of participants on the environmental issues impacted by the lack of effective nutrient management thereby encouraging broader adoption and implementation of best management practices.
- Engagement of farmer participants who do not normally participate in most conservation programming.
- Media engagement and other dissemination of information about the project beyond those actively participating.

What portions of the Indiana On-Farm Network® CIG struggled:

- Turnover of staff within three of the four primary contributors of Indiana On-Farm Network® CIG lead to aspects of the program being modified over the grant. In particular, the exit of Dr. Tracy Blackmer from the Iowa Soybean Association (ISA) lead to ISA restructuring their On-Farm Network® services to other states. This had the positive benefit for the Indiana On-Farm Network® program of forcing the development of Indiana based meeting facilitators and the Indiana State Department of Agriculture (ISDA) project coordinator performing some of the data management tasks that were initially being done by ISA. A negative result of ISA's restructuring was the lack of personnel in the other contributors to perform some of the higher level evaluations of Indiana On-Farm Network's® data to judge its effectiveness on improving N efficiency for corn. To correct this lack going forward, ISDA and the Indiana Corn Marketing Council/ Indiana Soybean Alliance (ICMC/ISA) are developing new partnerships with organizations; Purdue University is one example, capable of supplying the needed evaluations.
- As the On-Farm Network® program expanded beyond the initial local groups, some new local group leaders struggled understanding all aspects of the protocols required for successful replicated strip trials (RST). This lead to some RSTs being installed by the growers but not being considered adequate for full analysis. It was only after problems were apparent that Indiana On-Farm Network® worked to develop better support materials and provided training to the local groups wanting to have replicated strip trials.

DISCUSSION OF QUALITY ASSURANCE:

The Indiana On-Farm Network® project followed the protocols developed by the Iowa Soybean Association (ISA). See references in the appendix. In Indiana the project focused on volunteered fields within the Mississippi River Basin. The program's goal was to engage growers in multiple HUC 8 watersheds who were willing to work within the program to improve their nutrient management efficiency.

Initially, all aerial imagery and stalk sampling on project fields was directed by the staff at ISA. Furthermore, the aerial imagery and lab work was performed by the same companies that work with ISA's program to ensure that collected data was comparable to existing research. ISA's staff prepared the yearly reports, presented the aggregated results and led the winter meeting discussions with the program's participants.

With mentoring support from ISA, the Indiana program developed staff within state capable of directing the sampling and presentation of the data, while still working with the aerial imagery provider and laboratory familiar with the program.

FINDINGS:

The Indiana On-Farm Network® CIG project included the following accomplishments:

- Enrolled 244 growers in 22 local groups across 19 HUC 8 watersheds within the Mississippi River Basin in voluntary efforts to identify and implement strategies to apply N fertilizer (including manure) more efficiently.
- Evaluated over 142,000 acres using aerial imagery and guided stalk sampling for alternative N management practices.
- Engaged conventional tillage growers who are traditionally resistant to conservation programs (See Appendix A - Over 50% of the enrolled fields reported conventional tillage).
- Assisted more than two dozen local conservation personnel in understanding the value of peer-to-peer and farmer participatory learning for encouraging long-term nutrient management improvements.
- Developed the infrastructure in Indiana to collect, analyze and present the data from the individual field level through pooled regional data while providing farmer confidentiality.
- Produced and distributed timely information on the value of improving nutrient management efficiency through the project to benefit water quality.
- Developed publically accessible Indiana On-Farm Network® website where project results and findings are posted for the benefit of all: http://www.in.gov/isda/ofn/

Social Indicator Survey of Indiana On-Farm Network® grower participants – led by Dr. Linda Stalker Prokopy - Purdue University Associate Professor of Natural Resource Social Science:

Purpose:

- Understand if the networks are increasing adoption of nitrogen management practices.
- Provide recommendations to improve the network

Research Questions:

- Are farmers who participate in formal networks more likely to adopt nitrogen management practices than farmers who do not?
- Are farmers in these formal networks spreading knowledge of these practices throughout their informal networks?
- Do these farmers discuss their nutrient management decisions with their fellow farmers?

Methods:

- In-depth Interviews
    - 15 OFN
- Census survey of all OFN farmers
    - 253 farmers surveyed

Results:

- Response rate: 62.8%
- On-Farm Network Value (scale of 1-5)
    - Nitrogen Strip trails most highly regarded: 4.76/5
    - Aerial imagery is useful: 4.27/5
    - Corn stalk nitrate tests useful: 4.25/5
    - Winter meetings a chance to learn about N management: 4.18/5
    - Group leader is important to the success of network: 4.13/5
- Network Outcomes
    - 45.2% say they have changed their N management because of OFN.
    - 43% say they have changed their N rates because of OFN.
    - 7.4% say their friends and neighbors influence their management decisions.
    - 74.8% share their knowledge of N management with other farmers.
    - 10.4% see those other farmers they talked to changing their N management.
    - 31.8% say OFN has increased their profitability.
    - 47% have recommended joining OFN to other farmers.
- Specific Nutrient Management Practices
    - Network farmers use the following practices **more** than the average farmer:
        - Conduct regular soil tests (P=0.001)
        - Variable rate fertilizer applications (P=0.051)

CONCLUSIONS AND RECOMMENDATIONS:

The Indiana On-Farm Network® has successfully shown the value of and interest in voluntary, farmer-driven networks in order to improve nutrient efficiency and improve water quality. The willingness of this diverse group of Indiana growers to participate in the program highlights the need for nutrient recommendations to distinguish between time of application, N sources and method of application and provide growers with an accessible way to compare the economic impacts of different practices.

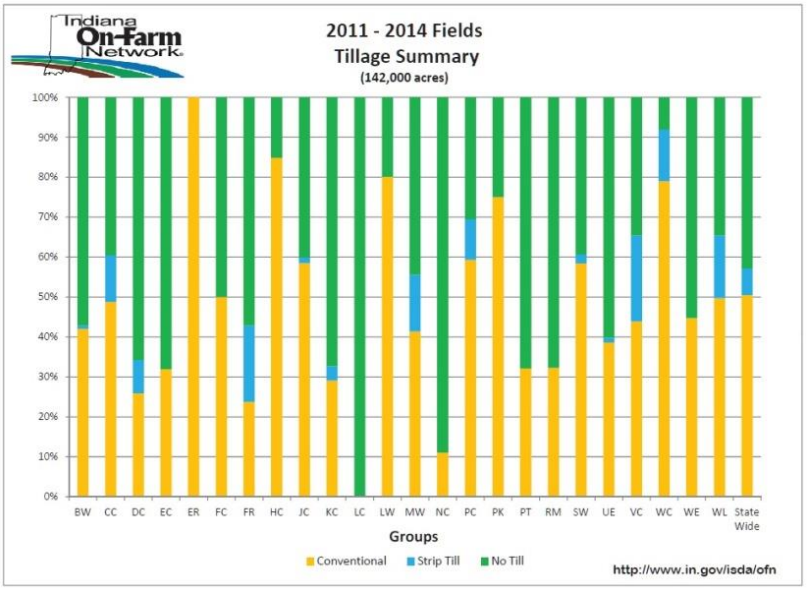
At the conclusion of the CIG, the Indiana On-Farm Network® is more than five times larger than anticipated when the project started. Its rapid growth was driven by both the growers demand for access to the program as well as local conservation personnel understanding the benefit of improved nutrient management to the environment.

The major partners behind the Indiana On-Farm Network® are committed to continue supporting the program both in Indiana and in other corn-growing states. Indiana Corn Marketing Council/Indiana Soybean Alliance (ICMC/ISA) incorporated their continued support in their March 2014 three year strategic plan with commitments to continue funding and increase grower participation in years 2015 - 2017. As part of ensuring that On-Farm Network® stays relevant to Indiana growers, the Indiana State Department of Agriculture (ISDA) and ICMC/ISA are partnering with Purdue University, College of Agriculture, to set up an Indian ON-Farm Network® Advisory Council to coordinate and direct the future of the program. On a national scale, ISDA, ICMC/ISA, the Environmental Defense Fund and the Iowa Soybean Association are active participants in the Multi-State On-Farm Partnership.

APPENDICES:

A. Field Reports and other data

- http://www.in.gov/isda/ofn/results.htm



B. Major Publications and Websites

- Indiana On-Farm Network® - http://www.in.gov/isda/ofn
- Iowa On –Farm Network® - http://www.iasoybeans.com/programs/farm-network
- USDA – NRCS. “Nutrient Management Data Collection & Analysis for Adaptive Management “Guided End-of-Season Stalk Nitrate Testing.”” *Indiana Job Sheet – 590* (February 2011)
- Fee, Rich. “Grassroots Research, Harnessing the Power of On-Farm Experiments.” *Successful Farming* (October 2011): 42-45. Print
- Kuhn, Megan. "Using Data to drive Management Decisions." *Indiana Corn & Soybean Review* 6.2 (2012): 32-33. Print.
- Goode, Cris. "Data Driven Decision Making Made Easy." *Indiana Corn & Soybean Review* 6.3 (2013): 26-27. Print.
- Leader, Meg. "Images Provide Insight." *Indiana Corn & Soybean Review* 7.3 (2014): 25. Print.
- Leader, Meg. "Learning the Ins and Outs of Corn Stalk Nitrate Testing." *Indiana Corn & Soybean Review* 7.3 (2014): 42. Print.

- "Nitrogen Status in Corn – Learning from Guided Stalk Sampling." *On-Farm Network Advance*. Iowa Soybean Association, 7 Feb. 2013. Web. <http://www.isafarmnet.com/Advance/AdvanceFebruary7.pdf>.
- "Value of Shared Data." *On-Farm Network Advance*. Iowa Soybean Association, 5 Dec. 2013. Web. <http://www.isafarmnet.com/Advance/AdvanceDecember5.pdf>.
- Kyveryga, Peter. "Farmer Networks across Country Share Common Goals and Look for Partnership." *On-Farm Network Advance*. Iowa Soybean Association, 22 May 2014. Web. <http://www.isafarmnet.com/Advance/AdvanceMay22a_2014.pdf>.
- Arp, Allie. "On-Farm Network® Shares Distinguished Replicated Strip Trial Process." *On-Farm Network Advance*. Iowa Soybean Association, 17 July 2014. Web. <http://www.isafarmnet.com/Advance/AdvanceJuly17_2014_1.pdf>.
- Further publications found at: http://www.in.gov/isda/ofn

C. Major Conferences and Grower Group Meetings

- Seger, Jordan. "Indiana On Farm Network." Presentation at USDA – NRCS Northwest Indiana Area Meeting. 25 Sept. 2012
- Seger, Jordan, et al. "Adaptive Management, Peer to Peer Learning and Advancing Soil Health." Presentation at the Soil and Water Conservation Society – Hoosier Chapter Fall Meeting. 16 Nov. 2012
- Seger, Jordan. "Indiana On Farm Network." Presentation at the Indiana Association of Professional Crop Consultants Annual Meeting. 7 Mar. 2013
- Seger, Jordan. "Indiana On – Farm Network." Presentation at the Indiana Certified Crop Advisor Annual Conference. 18 Dec. 2013
- Seger, Jordan. "Your Role in Replicated Strip Trials." Presentation at the Indiana Association of Soil and Water Conservation Districts Annual Conference. 7 Jan. 2014
- Seger, Jordan. "Farmer Networks – Adaptive Nutrient Management and Databases for Continual Improvement in Farm Practices." Presentation at the Iowa Soybean Association's On-Farm Network Conference. 20 Feb. 2014.
- 62 Grower meetings throughout Indiana to share and discuss Indiana On-Farm Network® results with grower participants. 2010-2014

D. Webinars

- Seger, Jordan. "Indiana On Farm Network." Indiana Conservation Partnership. 12 Sept. 2012. Web. http://icp.iaswcd.org/resources/webinars/.

- Morris, Tom, Jordan Seger, Quirine Ketterings, Chris Sigmund and Jim Camberato. "Getting More Bang for Your Buck from Adaptive Nutrient Management - Helping Farmers Improve Nutrient Use Efficiency." *Getting More Bang for Your Buck from Adaptive Nutrient Management – Helping Farmers Improve Nutrient Use Efficiency*. USDA, 23 May 2013. Web. <http://www.conservationwebinars.net/webinars/adaptive-nutrient-management-nrcs-tech-note>.
- Seger, Jordan and Greg Kneubuhler. “Fertilizer Optimization Info Session for Walmart Suppliers.” Webinar. 27 June 2013.

E. References

- Kyveryga, P.M., T.M. Blackmer, R. Pearson, and T.F. Morris. "Late-season Digital Aerial Imagery and Stalk Nitrate Testing to Estimate the Percentage of Areas with Different Nitrogen Status with Fields." *Journal of Soil and Water Conservation* 66.6 (2011): 373-385.
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- Kyveryga, P.M., T.M. Blackmer and R. Pearson. “Normalization of uncalibrated late-season digital aerial imagery for evaluating corn nitrogen status.” *Precision Agriculture 13 (2012): 2-16*
- Camberato, Jim and Bob Nielsen. "Corn Stalk Nitrate Tests – Research and Recommendation Update." Purdue University Department of Agronomy, 15 September 2014. Web. < http://www.agry.purdue.edu/ext/soilfertility//news/cornstalknitrate.pdf>.

F. Project Budget

Amounts represent the time period of: 9/21/10 – 9/20/14

Indiana Corn Marketing Council Cash Match	=	$100,000.00
Indiana Soybean Alliance Cash Match	=	$50,000.00
Environmental Defense Fund Cash Match	=	$39,125.00
Indiana Corn Marketing Council in kind staff	=	$22,500.00
Indiana Soybean Alliance in kind staff	=	$10,000.00
ISDA in kind staff and resources	=	$200,000.00
Total Cash Match	=	$189,125.00
Total In Kind Match	=	$232,500.00
Grand Total Match	=	$421,625.00

CIG expenses on 9/20/14 = $363,676.05

BUDGET INFORMATION - Non-Construction Programs

OMB Approval No. 0348-0044

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. CIG	10.192	$	$	$ 450,000.00	$ 525,300.00	$ 975,300.00
2.						0.00
3.						0.00
4.						0.00
5. Totals		$ 0.00	$ 0.00	$ 450,000.00	$ 525,300.00	$ 975,300.00

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY (1) CIG	(2) Match	(3)		Total (5)
a. Personnel	$	$ 210,300.00	$	$	$ 210,300.00
b. Fringe Benefits					0.00
c. Travel					0.00
d. Equipment					0.00
e. Supplies					0.00
f. Contractual	405,000.00	315,000.00			720,000.00
g. Construction					0.00
h. Other					0.00
i. Total Direct Charges *(sum of 6a-6h)*	405,000.00	525,300.00	0.00	0.00	930,300.00
j. Indirect Charges	45,000.00				45,000.00
k. TOTALS *(sum of 6i and 6j)*	$ 450,000.00	$ 525,300.00	$ 0.00	$ 0.00	$ 975,300.00
7. Program Income	$	$	$	$	$ 0.00

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