USDA Natural Resource Conservation Service
Conservation Innovation Grants (CIG)
Fiscal Year 2012

TITLE: Assessment of Conservation Innovation Grants Nutrient Management Projects and Recommendations for Future Adoption and Incorporation into Practice Standards

Final Report Submitted
by
Luther Smith, Project Director
American Society of Agronomy (ASA)

October 1, 2012 - September 30, 2013

Grant Number: 69-3A75-12-205

Project Deliverables:

- Complete Assessment of 30 national and 6 state water quality CIG projects
- Set of recommendations for NRCS
- Evaluation tool for future assessments
- Briefing for NRCS staff
- Publication of results
- Semi-annual and final reports to NRCS
- Participation in NRCS event

Table of Contents

Executive Summary 3
Introduction 4
Project Background 5
Review of Methods 7
Discussion of Quality Assurance 9
Findings 9
Conclusions and Recommendations 10
  Conclusions 10
  General Recommendations 11
    Better Definition of CIG Program Purpose 11
    Application and Review Process 12
    CIG Project Reporting 13
    Identification of Technical Issues to be addressed by NRCS 14
  Recommended Practice Standard Revisions and Projects to be Adopted 14
    Recommended Revision to NRCS Practice Standard 554, Drainage Water Management (NRCS, NHCP, September 2008) 15
    Top Five CIG Projects (not in ranked order) Identified by Review Team as "Most Promising" 15
    Projects Recommended for Adoption 15
Appendix A: Assessment Tool 17
Appendix B: Summary of Project Reviews by Individual Team Members 25
  CIG Project Demographics 25
  Lessons Learned/New vs. Existing Technology 27
  Overall Findings 29
  Cost Effectiveness 29
  Impacts 29
  Development of Publication/Technology to Promote Technology 30
  Replication and Applicability 31
  Transferable Results 33
  Additional Outreach Efforts 34
  Policy/Program Guideline Changes 35
  Practice Standards Addressed 35
  Should future CIG funding be utilized to support further efforts in this project technology? 36
Appendix C: CIG Assessment Review Team Meeting Agenda 41

Executive Summary

This grant was funded to address the "CIG Projects Assessment" national component of the fiscal year 2012 NRCS Conservation Innovation Grants (CIG) Program. The NRCS CIG National Priority Need addressed by the American Society of Agronomy (ASA) was to "Conduct an assessment of completed CIG projects on a given topic to identify and recommend those projects that should be adopted and the associated conservation practice standards that should incorporate those findings." As proposed and approved in the grant agreement, the project goal was to evaluate 36 projects, provide recommendations and identify practice standards to be incorporated in NRCS policy and future CIG efforts. The objective of this CIG assessment grant was not to generate innovation but to identify innovations in CIG nutrient management/water quality projects that may be appropriate for adoption on a broader scale.

Major accomplishments include: scientific review of 36 water quality grant projects; development of a comprehensive evaluation tool designed to assess all aspects of CIG projects and to identify specific innovations or technologies for adoption; and recommendations for NRCS drawn from a two-day review team meeting. Additionally, the grantee has scheduled a briefing for NRCS and will meet with NRCS headquarters staff for additional briefings or participate in a NRCS CIG showcase type event as requested. Finally, the grantee is investigating potential opportunities for knowledge transfer of findings to the ASA network of certified crop and soil science advisers as appropriate and applicable.

The goals and objectives of the project were met, and the project was completed on time despite several challenges. Project funding announcements and actual award of contracts by NRCS were delayed, which delayed the original anticipated start date of the project. Additionally, there were challenges in obtaining the actual grant reports, both for national and state projects, setting back the original proposed timetable for reviewers to begin the review process. This was especially difficult as only a limited number of the water quality/nutrient management projects had completed reports available for review.

The primary customer who will benefit from this grant is NRCS as the agency uses the review team recommendations to improve the CIG process. Additional beneficiaries could include other agencies and producers themselves, as well as ASA certified crop and soil science advisers, who could benefit from new technologies to be promoted.

Project funds were spent as anticipated with no major changes in the budget. As the purpose of this grant was assessment rather than innovation, no alternative technologies were introduced in this project. Quantifiable physical results include the 36 project reviews and the summary of recommendations. Potential economic results could be realized as improvements to the CIG program are incorporated to more efficiently utilize taxpayer dollars, both on the federal level and potentially on the state level, as results are made available to state CIG programs.

Major recommendations from the project focused primarily on refining the CIG program itself in four areas, as follows: 1) Better definition of the purpose of the CIG program; 2) Application and review process; 3) CIG project reporting; and 4) Identification of technical issues to be addressed by NRCS, including one suggested revision to Practice Standard 554. Additionally, five "most

promising" projects and innovations were identified for future promotion. The "Conclusions and Recommendations" section of the report further describes specific recommendations.

Introduction

The purpose of this grant was to conduct an assessment of Conservation Innovation Grants nutrient management and water quality projects and to develop recommendations for future adoption and incorporation into practice standards. The grantee organization was the American Society of Agronomy (ASA), collaborating with Strategic Conservation Solutions, LLC, to conduct the assessment.

Luther Smith, CAE, Director of Certification and Licensing for the American Society of Agronomy (ASA) and Soil Science Society of America (SSSA), served as the Project Director and provided project management and oversight, selection and coordination of the review panels, adherence to budget parameters, management of staff and non-staff consultants and reporting requirements. Mr. Smith has combined experience of 25 years in agricultural production, farm management, input sales, extension education, association management and ranch operation and ownership. He is a Certified Association Executive (CAE) with a BS in Farm Operation and an MBA. Wes Meixelsperger, CPA, CFO for ASA and SSSA, provided financial oversight and reporting. ASA/SSSA staff provided logistical assistance with planning an orientation webinar for the team in December 2012 and for the in-person team meeting in July 2013. Michele Lovejoy, ASA Program Manager for Professional Development, developed a portal on the ASA website for team members to access copies of the reports, practice standards and other materials, as well as to access the links to the Survey Monkey to complete and submit assessments. Dr. Bruce Erickson, Ph.D., CCA/CPAg, ASA Agronomic Education Manager will be assisting in knowledge transfer to membership as appropriate.

Strategic Conservation Solutions, LLC (SCS) helped complete the Assessment Project by contacting NRCS state offices regarding state-based CIG grants; collaborating with CIG headquarters staff to obtain national reports for review; conducting orientation and coordination for the review panel; providing strategic advice and guidance for developing assessment criteria; and drafting a summary of recommendations, as well as providing other support activities as needed. Bruce Knight, Principal and Founder of SCS, served as Chief of NRCS from 2002 through 2007 and has over 25 years' experience in the conservation community. Julie Knight, SCS Chief Operations Officer, has several years experience in grants management and administration. Elizabeth Griswold, Mississippi State University graduate and SCS Student Intern through the Michigan State University William A. Demmer Scholar Program, was instrumental in compiling and writing the assessment summaries and meeting minutes.

The Project Review Panel included five ASA and CCA members as follows:

- Troy Bauder, M.S., CCA, Colorado State University
- Fabián Fernández, Ph.D., University of Minnesota
- Dave Franzen, Ph.D., CCA, CPAg, North Dakota State University
- Deanna Osmond, Ph.D., North Carolina State University
- Edwin Ritchey, Ph.D., CPSS, University of Kentucky

All panelists are members of the American Society of Agronomy and the Soil Science Society of America. As noted, two panelists are Certified Crop Advisors (CCAs), and one is also a Certified Professional Agronomist (CPAg). Another panelist is a Certified Professional Soil Scientist (CPSS). Three panelists hold Ph.D.s and two panelists hold M.S. degrees in agronomy, soil science, or a closely related field of study. Each panelist has ten or more years of combined experience in the agriculture profession from positions in academia, government and/or the private sector with a focus of work, research and/or teaching directly related to nutrient management and/or soil and water management with an emphasis in farm application/production agriculture.

John Davis, Agronomist-Nutrient Management Specialist with USDA NRCS, served as the CIG Program Technical Contact and was an invaluable advisor throughout the project. Davis helped coordinate the training on NRCS practice standards for the review panel, provided feedback and review of the assessment tool, and participated in the two-day panel meeting as a technical expert and advisor.

Project tasks included:

- Selecting an expert panel to review project reports and complete individual assessments;
- Identifying potential national and state CIG nutrient management and/or soil and water management-focused projects for review and collecting project final reports (including outreach and contact with NRCS headquarters and state offices staff to obtain reports) and then down-selecting to 30 national and 6 state CIG projects for review;
- Conducting orientation webinar for panel review team, including training on practice standards and an overview of the project, as well as obtaining feedback for development of the assessment tool;
- Developing an assessment tool to include scoring criteria to determine when a new approach is considered cost and conservation-effective, meriting replication and expansion (Appendix A: Assessment Tool);
- Creating a website portal for review team to access grant reports, background materials and the Survey Monkey assessment tool;
- Coordinating team members' review and assessments for 7 or 8 projects each, involving identification of new practices, technologies and management systems, etc., established by each project to improve nutrient management/water quality.
- Compiling and summarizing assessment results for distribution and review by team (Appendix B: Summary of Project Reviews; Also see Assessment "Red Book");
- Scheduling and conducting a two-day review team meeting, including the grant project NRCS CIG technical advisor, to review assessment summaries and develop recommendations for NRCS (Appendix C: Meeting Agenda); and
- Writing final report to include findings, conclusions and recommendations to NRCS.

Project Background

As stated on the NRCS website, "Conservation Innovation Grants (CIG) is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and

technologies while leveraging Federal investment in environmental enhancement and protection, in conjunction with agricultural production. Under CIG, Environmental Quality Incentives Program funds are used to award competitive grants to non-Federal governmental or nongovernmental organizations, Tribes, or individuals. CIG enables NRCS to work with other public and private entities to accelerate technology transfer and adoption of promising technologies and approaches to address some of the Nation's most pressing natural resource concerns. CIG will benefit agricultural producers by providing more options for environmental enhancement and compliance with Federal, State, and local regulations."

While each CIG grantee must evaluate its project and submit a final report, there has not been an overall independent review and assessment of these results since the project's inception in 2004. Thus, innovations coming from these projects have not been widely publicized or incorporated into new or existing conservation practices. The CIG Assessment Project conducted by the American Society of Agronomy under this grant is an effort to identify innovations in nutrient management/water quality that are appropriate for broader adoption by producers.

According to an initial review conducted by Strategic Conservation Solutions in the winter of 2012, more than 45 grants of the total 264 national CIG projects completed from 2007 - 2011 addressed nutrient management and/or water quality. An estimated $18 million was awarded from 2007 to 2011 for nutrient management and/or water quality projects, or almost 20 percent of the total $91.6 million awarded under CIG during this period. Indications from the preliminary review were that approximately 30 of the nutrient management/water quality projects were complete and ready for assessment. The CIG Assessment Project sought to assess the effectiveness of these projects to identify and recommend those that should be adopted along with the associated conservation practice changes that should be incorporated into existing standards.

NRCS originally approved a review of 30 national and 6 state CIG grants from 2007 through 2011. However, the project scope was amended to include grants completed through 2013 since it was found that there were actually too few final reports of completed projects available for review when the CIG Assessment Project began in the fall of 2012.

By design, the primary beneficiary of this project is NRCS and its partner organizations, which will have the analysis it needs to identify successful nutrient management/water quality innovations and make that information available to agricultural producers and the conservation community. Assessment recommendations suggest areas of improvement to further the goal of CIG to promote the transfer of conservation technologies, management systems and innovative approaches into both NRCS policy and practices as well as into the private sector. The assessment findings will also help NRCS determine which practices/technologies require further demonstration and integration. Additionally, ASA is offering suggestions for transferability to other agencies and producers.

A secondary intended beneficiary of this project is the grantee organization (ASA) itself, which can share the results with professionals in the field by utilizing its established network and communications channels, reaching approximately 15,000 certified professionals who work with 375,000 potential farmer/rancher clients who are estimated to be responsible for approximately

70 percent of the cropland in the United States. ASA will consider highlighting some of the most promising CIG innovations in its *Crops and Soils* magazine and may also conduct educational webinars on practices related to nitrogen issues and drainage water management identified through the CIG reviews.

Review of Methods

Preliminary Data Collection and Project Start-Up Work

Working with NRCS CIG program staff, SCS identified potential completed national nutrient management and water quality projects to be assessed. Additionally, NRCS CIG staff provided a list of state component CIGs involving nutrient management and water quality, and SCS contacted the appropriate State Conservationists to obtain copies of project reports. ASA submitted a "Request for No-Cost Change in Scope" to NRCS on February 7, 2013, when it became clear that there were not enough high quality, publically available, completed national projects or state projects (representing two per region and no more than one per state) available from the original 2007-2011 time period. This change enabled ASA/SCS to include CIG projects completed through the end of 2013, which expanded the pool of grants since final reports for most of the 2008 grants were not published to the NRCS website until May 2013. Additionally, the request eliminated the quota requirements for state projects so the best 6 related projects could be reviewed. Additionally, the grantee established a list of alternate projects in case a review team member determined that an assigned project did not meet minimum criteria for review.

ASA identified potential organization members and Certified Crop Advisors (CCA) who met specified criteria to serve on a review panel. The grantee recruited six members to serve, taking special effort to seek out reviewers with experience working with NRCS practice standards. ASA held an orientation webinar for the review team on December 20, 2012, covering training on practice standards conducted by NRCS experts and an overview of the project and seeking suggestions for developing the assessment tool.

Working with NRCS CIG staff, ASA/SCS identified the six practice standards related to water quality/nutrient management to be evaluated for in the project assessments as follows: 327-Conservation Cover; 328-Conservation Crop Rotation; 329-Residue and Tillage Management/No Till/Strip Till/Direct Seed; 340-Cover Crop; 554-Drainage Water Management; and 590-Nutrient Management. SCS also reviewed the NRCS internal project evaluation template to identify assessment gaps and additional criteria to be considered. ASA/SCS then worked collaboratively via electronic and teleconference communication to develop evaluation criteria and an assessment tool for evaluating the completed CIG projects. The final tool was provided to the NRCS CIG technical advisor for final approval.

Review of Selected CIG Projects

ASA staff developed a CIG review team portal on the ASA website and posted copies of the webinar, applicable practice standards and technical notes. The portal was launched on February 22, 2013, with the final assessment tool and copies of initial final reports that were

available from NRCS, and the review team was notified and asked to begin the assessment phase. Reports were distributed for equitable workloads, and no reviewers were assigned projects from their own state for review. On May 3, 2013, NRCS informed SCS/ASA that all remaining report projects were available; reports were posted the next business day and the team notified.

Team members completed all assessments by May 28, and SCS compiled, summarized and organized assessment data in three ring binders for review by the team. Binders (the Assessment "Red Book," a copy of which has been given to the NRCS Technical Advisor and will be submitted with this report) contained the following: copies of individual assessments; demographic information on project beneficiaries, methods utilized and resource concerns addressed; and summaries of assessments related to cost effectiveness, impact, replication, applicability, transferability, lessons learned, proposed modifications to practice standards, policy/program guideline changes and additional outreach and publications recommended for development.

Panel Review Team Meeting/Development of Recommendations for Presentation to NRCS

Team members received their "Red Book" the week of June 17, 2013, for review prior to the team meeting. They met July 9-10, 2013, to analyze the individual assessments and develop recommendations for projects that should be adopted. The panel attempted to categorize recommended new practices, technologies and systems, based on whether the innovation should be part of a new policy, or included in NRCS manuals, guides and references or incorporated into existing conservation practice standards. Additionally, the panel developed overarching recommendations for NRCS regarding the CIG Program as well as brainstormed suggestions for potential assessment project follow-up focusing on knowledge transfer to the ASA network.

What Worked and Didn't Work and What Would be Done Differently

The process for accessing final reports was arduous and very time-consuming. ASA/SCS recommends that NRCS consider developing guidelines for its staff for working with an external reviewer to make CIG final reports available promptly if the agency plans to conduct a similar review in the future. In addition, ASA/SCS recommends as broad a scope as possible for any future reviews to ensure access to a sufficient number of reports.

Utilizing an electronic format for conducting the individual project assessments worked well, making it easy for each reviewer to complete the assessment form. Reviewers could start a review and return to it later to finish it. The instrument enabled reviewers to click on the appropriate response and/or fill in comments as needed for open-ended questions. Reviewers could select responses from a menu of choices and then be directed to the appropriate follow-on page, depending on how they answered as opposed to having to scan through multiple pages to find the right place in the survey. However, while the Survey Monkey tool was relatively easy to set up and complete, SCS would recommend that a different electronic format be sought out if possible as it was not possible to print all the reviewers' responses to one question at a time, and collating the data proved to be a time-consuming process. A standardized review format would ensure that future assessment projects fully meet the needs of the agency.

Discussion of Quality Assurance

This grant was not introducing new innovations or testing new technologies so certain quality assurances described in the final report guidelines are not applicable.

Technical experts conducted the CIG project assessments, and NRCS technical experts trained reviewers on the standards and the standard setting process. Reviewers were not assigned to assess grants from their own states or institutions in order to avoid institutional bias. The review team devoted extensive time presenting and discussing individual findings/observations during its meeting. Consensus recommendations came from those discussions. The NRCS CIG project technical advisor also participated in the review panel meeting as a technical expert and advisor.

Findings

An initial intended outcome of this CIG Assessment Project was to assess cost and conservation effectiveness meriting replication and expansion. However, this is difficult to do when criteria and measures are not in place and established prior to the start of the CIG project and/or are not addressed in final reports to NRCS.

A critical question to consider is if cost-effectiveness is an objective of CIG. Minimal data were actually reported related to cost, so if cost-effectiveness is important, CIG projects need to have an evaluation template that includes a request for relevant information related to costs, whether it is cost to producer, program costs, or delivery costs. Further, should the focus be cost-effectiveness of individual projects or cost-effectiveness of overall CIGs? The panel also recognized that the CIGs are intended to encourage innovation, providing money to "try it," and what may not be very cost effective in early years may become more so through further trial and development in future years. Ultimately, producers' adoption will determine and speak to cost effectiveness.

It was also difficult to measure the impact of specific innovations on resource concerns such as water quality or erosion control as there was usually insufficient data given. The review panel agreed that, in many cases, it would be premature to measure the actual impact that the innovative technology had on the desired outcome. For instance, a project may have addressed water quality but did not actually measure the impact it had on water quality.

Individual panel members' assessments attempted to evaluate or at least comment on questions of cost-effectiveness and impact, and reviewers did identify projects to be adopted or potentially adopted with additional work. Nevertheless, it was difficult to provide more technical recommendations for incorporating the findings into practice standards and future practices due to insufficient data demonstrating direct correlations. Many of the final reports lacked the data and measurement to support the project conclusions.

Of the 36 projects reviewed, review team members identified 5 CIG projects as using new technologies, 14 as using existing technologies in a new application or focus, and 17 projects were identified as using existing technologies without any new applications. Panelists were also

asked to determine if future CIG funding should be utilized to support further efforts in the project technology that was utilized. Responses were as follows:

- 6 projects -- Results do not warrant further action, and it was recommended that efforts not be repeated;
- 9 projects -- Results were promising and the concept makes sense, but the benefits are not clear or clearly documented so additional work is necessary;
- 10 projects -- Results were promising but barriers need to be addressed through future CIG projects or other NRCS channels before widespread adoption is recommended; and
- 11 projects were recommended for adoption and to be incorporated into further NRCS work.

Of the 11 projects recommended for adoption, 8 of the projects utilized existing technology and 3 utilized existing technology with a new focus. Of the 19 total projects in the two "promising" categories, 4 projects employed new technology, 9 utilized existing technology with a new focus, and 6 projects utilized existing technology, with the breakdown evenly divided between the two.

See "Appendix B: Summary of Project Reviews" for an overview of assessment results and the "Red Book" for a review of comments and observations for each specific project assessment.

Conclusions and Recommendations

Conclusions

None of the projects recommended for adoption employed new technologies, and in fact, almost two-thirds of those projects (8 of the 11) utilized existing technologies. One can conclude that those projects employing existing technologies have already been tested, thus are more likely to be ready for adoption at the time of grant award. Additionally, the CIG program is providing the opportunity to affirm that the technologies do work, and CIG is being used "to apply or demonstrate previously proven technology" as is a stated purpose of the program in CIG announcements for program funding.

Due to the difficulty in assessing cost effectiveness and impact and the challenges of developing sound technical recommendations, one can also conclude that CIG program needs better definition of the program as a whole, as well as application, review and reporting procedures, so that CIG can more effectively meet its second stated purpose that "CIG projects are expected to lead to the transfer of conservation technologies, management systems, and innovative approaches into NRCS policy, technical manuals, guides, and references, or to the private sector."

The most successful projects incorporated outreach with multiple levels of delivery, included scientific research that can be measured as an embedded component of the project, attempted to anticipate major environmental challenges, and provided direction to NRCS for regional refinement of practice standards as well as programs and policy.

General Recommendations

Major recommendations from the project focused primarily on refining the CIG program itself in four areas, as follows: 1) Better definition of the purpose of the CIG program; 2) Application and review process; 3) CIG project reporting; and 4) Identification of technical issues to be addressed by NRCS.

Better Definition of CIG Program Purpose

As stated in the CIG program funding announcement, the overarching purpose of CIG "is to stimulate the development and adoption of innovative conservation approaches and technologies, while leveraging the Federal investment in environmental enhancement and protection in conjunction with agricultural production." The review panel shared general observations about if the CIG program was achieving the intended objectives and agreed that while the funding was supporting some implementation of innovative conservation approaches and technologies, the adoption of new innovations and the transfer into NRCS policy, manuals, guides or the private sector may be limited.

Given that the CIG is entering its 10th year as a program, the review team recommends that NRCS should consider a review of the CIG Program, its purpose and definition, to be conducted prior to the 2014 program announcement and including:

- review of guidelines to clarify if a grant proposal is actually focused on using new technologies, existing technologies, or existing technologies in a new way or new region (i.e., what is considered as innovative);
- consideration of applied research as having an appropriate role in reaching the CIG goal of stimulating the development and adoption of innovative conservation approaches and technologies; and
- consideration of the need to develop better quantifiable measures to determine impact and cost-effectiveness.

It was discussed that CIG projects span a wide range from those that are trying out a new technology for the first time to those seeking to get widespread adoption and everywhere in between. One suggestion by the panel was to consider categorizing projects according to a logic model possibly for both proposal development and reporting. In other words, applicants should specify intended level of impact and reporting should be aligned appropriately (e.g., Level I -- Learning/New technology development; Level II -- Adoption/Number of users, etc.; and Level III -- Outcome/Actual impact on resource concern.)

There was also a perception that the CIG mandate has changed over time and provides opportunity for funding for projects that conduct invaluable applied agronomic and conservation work that is very difficult to get funded through any other sources. The panel felt that since a mutual goal of the CIG program and of those involved in this arena of applied agronomic research is getting superior practices implemented by producers, Congress should formally include applied research in its CIG process. NRCS could also consider including applied testing as a means of formalizing the evolution which has occurred in the CIG program implementation. The nature of this work is designed to solve practical problems, resulting in new knowledge and

innovations being transferred into practices and procedures to be adopted by other producers. NRCS should work with organizations such as NEERA1002 or SERA17 or any other relevant groups to discuss the criteria for consideration.

The use of a quantifiable ranking measurement of success of the project in terms of producer adoption of technology or other appropriate impact measurements would not only ensure funding goes towards appropriate projects, but would also narrow the field of applicants to those of a higher caliber who will implement the most innovative activities through their projects. An economic analysis of the project, both in the full proposal submission and the reporting after the project implementation, could be useful in determining cost effectiveness. An important caution relates to the need to maintain a delicate balance between imposing measurement requirements that are so rigid, possibly discouraging innovation, and ensuring that appropriate measures are in place to show impact and effectiveness.

Finally, it is necessary to consider how results will practically be utilized after project completion -- dissemination of innovations leading to producer adoption; transfer of technology, both internally and externally; development of new materials; informing policy changes -- and who will be responsible for that follow on activity.

Application and Review Process

Guidelines for applications as well as for review teams should be tightened and made more specific. Clear expectations for applicants and reviewers should be communicated, especially regarding questions raised in the preceding section. The criteria for review needs to be clearly communicated and tied to the application which, in turn, needs a direct connection to reporting requirements. NRCS should make the general evaluation standards for CIG application review available to prospective grantees to further clarify the agency's needs and expectation. If there are reporting tools or ranking measurements such as referenced above, they should be made available to applicants to improve the quality of applications. NRCS may wish to consider a possible review process advisory team, with representatives involved in developing the funding announcement and criteria, to provide oversight and advice to proposal reviewers.

NRCS needs to provide clear and concise instructions for the pre-proposal and proposal phase to help the applicant understand each step and produce a thorough proposal covering all aspects of the project. Proposal templates posted on the NRCS website should be clearly identified as applicable for the pre-proposal or for the full proposal submission. Beyond instructional changes, the team recommends that NRCS provide additional space for the applicant to describe the planned methodology. The goal would be to provide enough space for the applicant to make plans for the project clear while not offering so much space that an applicant feels obligated to provide excessive detail. Currently, as is standard protocol for many federal RFPs, the orientation to the CIG application process is conducted by NRCS via webinar. Consideration of collaborating with appropriate trade and other professional associations to conduct presentations at conferences or workshops on applying for CIGs could offer beneficial advice for applicants as well as help to produce higher quality applications.

Applicants could also benefit from knowing the type of projects and project leads that are of most interest to NRCS and CIG. Is more weight given to science-based applicants or those with

expertise in the field? Are those with past experience with CIGs and other USDA grant programs given a higher priority for acceptance and does their "track record" of producing projects with significant acceptance or implementation of conservation activities play a role in the grant approval process? One reviewer noted that there seems to be wide variation from year to year in priority issues based on current trends which can make it difficult for potential applicants to plan and apply. Match requirement issues are also a concern with CIGs. An applicant such as a foundation or private industry may have the funding but not the scientific capacity such as a university or possibly CCAs. On the other hand, other applicants may have capacity but no funding. What role is desired for the producer who may be limited in both funding and capacity? Is there a place in the CIG program for businesses seeking start up funds?

Finally, NRCS would also be encouraged to manage the CIG program such that the application and award process does not conflict with but rather supports growing season and demands for implementation.

CIG Project Reporting

The reporting template for CIG projects should also be reviewed. An improved template would link the project back to the methodology given in the proposal as a way to determine if the project is successful in completing what the proposal promised. Mid-year reports should also be reviewed by the NRCS technical contact in addition to the financial and administrative contacts to determine the need for any mid-project adjustments and to allow time to implement the necessary changes.

One method to ensure the final report is complete would be to withhold final payment or 10% of the grant funding until the completion and successful submission of the final report. Grantees should be held responsible for completing their project, and this is one strategy to ensure the final report is completed with sufficient information to evaluate the project.

Appropriate impact measurement and reporting, based on what level of impact the project was designed for, should be strengthened in the CIG process, with emphasis provided on this in the proposal application so that the grantee is prepared to report. Further, cost effectiveness should be a consideration by NRCS in evaluating the priority for program rankings of various practices. Expectations of measuring and reporting on cost effectiveness should become an evaluation criteria for all CIG projects.

If a goal of the CIG program is "the transfer of conservation technologies, management systems, and innovative approaches into NRCS policy, technical manuals, guides, references and the private sector," grantees should be asked to give related recommendations in their final report.

Beyond the completion of grants, NRCS must also ensure the results of the projects are available to others who could benefit from the same technology. This could be through dissemination of innovations, peer reviews, websites, or databases; however, careful consideration of pros and cons should drive decisions on the best outreach practices. Outreach should involve more than a website. Peer-reviewed articles offer insights into new innovations, but they are also very costly and do not disseminate knowledge directly to farmers, nor do many of the projects generate results conducive to journal standards. Specific publications suggested for outreach to farmers

include Section A of *JSWC*, the *Corn and Soybean Digest*, the *High Plains Journal* and the Nature Conservancy's newsletter. E-Extension offers another opportunity to share information and/or research. Not to be overlooked are the traditional on-the-ground methods of outreach -- such as field days, workshops, tours and seminars -- with producers, CCAs and others who can help promote the practices and innovations.

Further, as more conservationists are wanting to access CIG results, NRCS should consider putting CIG reports in a searchable database such as the one maintained by Sustainable Agriculture Research and Education (SARE) and ensure that content remains fresh. NRCS may also wish to evaluate how CIG reports are posted and organized on the website. Many final reports link to obsolete or dark web pages, so NRCS should set standards for maintaining sites and/or be sure links connect to PDF documents which can be accessed. The USDA NIFA Small Business Innovation Research National Impacts page organizes results and success stories by topic. There may be other ways for NRCS to organize results to be most useful to those interested in learning more about the innovation. The purpose of CIG is to find innovative conservation strategies and promote adoption of them. To achieve these goals, the results of these grants must be shared so they can benefit producers, consumers and the environment.

Identification of Technical Issues to be addressed by NRCS

In addition to specific recommendations for improving the CIG Program, the team identified general issues and technical areas of concern that it suggests NRCS should address, including:

- Need for additional research related to phosphorous, including consideration of the need for flexibility for possible local variations related to total P, dissolved P and soluble P.
- Promotion of cover crops. NRCS should continue to include cover crops as a priority topic for CIG funding, including consideration of challenges related to their use in semi-arid agriculture.
- Practice Standard 590 issues. Air losses and leaching losses are technologies for review.
- Role of livestock integrators in feed management decisions.
- Need for comprehensive watershed scale planning. According to one reviewer, currently conservation implementation is based on farm-scale decisions and is not designed at the synthetic scale of the watershed. Conservation practice implementation must be more intentional so that limited resources are used more effectively. If a CIG project's focus is on watershed planning, then the proposal must include watershed planning guidelines developed by EPA or at a minimum include delineation of the water quality pollutant(s) of concern, pollutant source, critical source areas, and watershed partners.
- Consideration of alpine ecosystems. One team member suggested that NRCS needs to be aware of work and issues in this arena related to ammonia contamination on ski slopes through grooming practices.

Recommended Practice Standard Revisions and Projects to be Adopted

A general comment by the review team about national standards is that standards need to be flexible and relevant based on local needs or situations. Future potential changes should consider possible variations according to state or regional levels.

Recommended Revision to NRCS Practice Standard 554, Drainage Water Management (NRCS, NHCP, September 2008)

- 554 (page 2) under 'Additional Criteria to Reduce Oxidation of Organic Matter in Soils' Suggest that the subtitle be instead: 'Additional Criteria to Reduce Oxidation of Organic Matter in Peat and Muck Soils'
- Revise 2nd paragraph to read "To reduce oxidation of organic matter in peat and muck soils (soils with greater than 12% organic carbon or greater than 20.6% organic matter), the outlet elevation shall be set to enable the water table to rise to the ground surface, or to a designated maximum elevation, for sufficient time to create anaerobic soil conditions……."

Top Five CIG Projects (not in rank order) Identified by Review Team as "Most Promising"

1. Demonstration of Enhanced Technologies for Land Application of Animal Nutrition Sources in Sensitive Watersheds (4-198), University of Kentucky Foundation
2. Nitrogen Loss Reduction in Crops (2008-0116-024), University of Missouri
3. On Farm Evaluation and Demonstration of Ammonia Reduction BMP for Feedlots and Dairies (6-139), Colorado State University
4. Phosphorus and Solids Removal from Anaerobic Digestion Effluent Through Electrochemical Technology (7-110), Washington State University
5. Optimizing Manure Nutrient Utilization (2008-0116-040), University of Wisconsin-Madison

"On Farm Evaluation and Demonstration of Ammonia Reduction BMP for Feedlots and Dairies" was the only project listed above that was actually determined to be "ready for adoption." The others were determined to be very promising yet needed additional work to better define benefits or address possible barriers to adoption.

Projects Recommended for Adoption

The assessment of the respective individual reviewer was that the technology demonstrated through the following projects should be adopted and incorporated into further NRCS work:

- Cooperative Conservation for Watershed Health
- Nitrogen Management During Corn Production
- Transitioning to No-Till Cover Crops
- Precision Agriculture on Grasslands
- Precision Feeding to Reduce Nutrient Losses from Virginia Dairy Farms
- State Project: Advancing Famer-Friendly, highly Effective Nutrient Use Efficiency
- State Project: The Use of Precision Ag in Cumberland and Salem Counties
- On Farm Evaluation and Demonstration of Ammonia Reduction BMP for Feedlots and Dairies
- Conservation and Integrated Pest Management
- Quantification of Impacts of On-Farm Water Capture, Storage and Re-Use of Surface Water on Water Quantity and Water Quality

- Pilot Project for Value-Added Product Development from Solid Waste Generated on Swine Farms

See "Appendix B: Summary of Project Reviews by Individual Team Members" for additional comments and for listings of other projects identified to be promising yet either additional work is needed or certain barriers need to be addressed before widespread adoption.

Appendix A: Assessment Tool

An electronic assessment tool was developed utilizing the "Survey Monkey" technology to enable Review Team members to complete and submit individual evaluations online on their own schedule. Reviews could be started, saved and returned to as time permitted.

Following are the questions which comprised the evaluation form. The Survey Monkey format allowed response choices which would direct the reviewer to the relevant page as opposed to having to scroll through multiple pages which were not applicable.

Reviewer Information
Please select your name from the options
Project to review: Select the specific project you wish to review at this time

Project Information
Fill in name of grantee:
Fill in grant number:
What land uses benefitted from the technology or method applied in this project? (Select all that apply)

- Non-Irrigated Cropland
- Irrigated Cropland
- Non-Irrigated Pastureland
- Irrigated Pastureland
- Rangeland
- Specialty Crop Lands
- Organic Lands
- Wetlands
- Farmstead
- Other: _____

Who is being served through this project? (Select all that apply)

Livestock Producers
Dairy Producers
Row Crop Farmers
Specialty Crop Growers
Small and Limited Resource Farmers
Irrigators
Other: _____

What communication/outreach methods were employed by this project? (Select all that apply)

Workshops
Technical Publications
Journal Articles
Website or Interactive Online Resources such as E-Extension
Training of Staff and Partners

Other:_____

What are the main resource concerns addressed through this project? (select all that apply)

Soil
Water
Air
Plant
Animal
Human
Energy
Nutrient
Tillage
Pest Management
Invasive Species
Irrigation
Animal Waste

Were these concerns adequately addressed (open ended)?

Applicable Practice Standard - 327: Conservation Cover

Is Practice Standard 327: Conservation Cover addressed in this project?
Yes
No

If Yes, which purposes of Practice Standard 327 apply to this project? Select all that apply

Reduce soil erosion and sedimentation
Improve water quality
Improve air quality
Enhance wildlife habitat and pollinator habitat
Improve soil quality
Manage plant pests

How do the grant results align with the applicable criteria as written in the current practice standard 327?

Applicable Practice Standard - 328: Conservation Crop Rotation

Is Practice Standard 328: Conservation Crop Rotation addressed in this project?
Yes
No

If Yes, which purposes of Practice Standard 328 apply to this project? Select all that apply.
Reduce sheet-and-rill or wind erosion

Improve soil quality
Manage the balance of plant nutrients

Supply nitrogen through biological nitrogen fixation to reduce energy use
Conserve water
Manage saline seeps
Manage plant pests (weeds, insects, and diseases)
Provide feed for domestic livestock
Provide annual crops for bioenergy feedstocks
Provide food and cover for wildlife, including pollinator forage, cover, and nesting

How do the grant results align with the applicable criteria as written in the current practice standard 328?

Applicable Practice Standard - 329: Residue and Tillage Management: No Till/Strip Till/ Direct Seed

Is Practice Standard 329: Residue and Tillage Management: No Till/Strip Till/Direct Seed addressed in this project?
Yes
No

If Yes, which purposes of Practice Standard 329 apply to this project? Select all that apply.
Reduce sheet/rill erosion
Reduce wind erosion and Particulate matter less than 10 micrometers in diameter - PM 10
Improve soil organic matter content
Reduce CO2 losses from the soil
Reduce energy use
Increase plant-available moisture
Provide food and escape cover for wildlife

How do the grant results align with the applicable criteria as written in the current practice standard 329?

Applicable Practice Standard - 340: Cover Crop

Is Practice Standard 340: Cover Crop addressed in this project?
Yes
No

If yes, which purposes of Practice Standard 340 apply to this project? Select all that apply.
Which purposes of this Practice Standard 340 apply to this project? (select all that apply from drop down menu)
Reduce erosion from wind and water
Increase soil organic matter content
Capture and recycle or redistribute nutrients in the soil profile
Promote biological nitrogen fixation and reduce energy use
Increase biodiversity
Suppress Weeds

Manage soil moisture
Minimize and reduce soil compaction

How do the grant results align with the applicable criteria as written in the current practice standard 340?

Applicable Practice Standard - 554: Drainage Water Management

Is Practice Standard 554: Drainage Water Management addressed in this project?
Yes
No

Which purposes of Practice Standard 554 apply to this project? Select all that apply.
Reduce nutrient, pathogen, and/or pesticide loading from drainage systems into downstream receiving waters
Improve productivity, health, and vigor of plants
Reduce oxidation of organic matter in soils
Reduce wind erosion or particulate matter (dust) emissions
Provide seasonal wildlife habitat

How do the grant results align with the applicable criteria as written in the current practice standard 554?

Applicable Practice Standard 590: Nutrient Management

Is Practice Standard 590: Nutrient Management addressed in this project?
Yes
No

Which purposes of Practice Standard 590 apply to this project? Select all that apply.
To budget, supply, and conserve nutrients for plant production
To minimize agricultural nonpoint source pollution of surface and groundwater resources
To properly utilize manure or organic by-products as a plant nutrient source
To protect air quality by reducing odors, nitrogen emissions (ammonia, oxides of nitrogen), and the formation of atmospheric particulates
To maintain or improve the physical, chemical, and biological condition of soil

How do the grant results align with the applicable criteria as written in the current practice standard 590?

Estimated Cost Effectiveness

Estimated Cost Effectiveness of Project

	Lost Cost	Medium Cost	High Cost	Unknown
Cost to Producer				
Program Cost				

Delivery Cost (NRCS/NGOs)
General comments regarding project cost effectiveness (open ended):

Replicability/Applicability

Ease of Replication:
- Low Tech (Easily replicated)
- Medium (May be replicated with adaptations as needed)
- High Tech (Can only be replicated with difficulty)
- N/A

Usage Applicability (select all that apply):
- Professional Use
- Large Commercial Farm Use
- Mid-to-Small Farm Use
- Applicable to All

Land Use Transferability (select all that apply):
- Non-Irrigated Cropland
- Irrigated Cropland
- Non-Irrigated Pastureland
- Irrigated Pastureland
- Rangeland
- Specialty Crop Lands
- Organic Lands
- Wetlands
- Farmstead
- Other: _____

Scale of Applicability (select all that apply):
- State Level
- Regional
- National

General comments on replicability/applicability (open comment):

Project Impact

Impact of the Technology/Methodology Employed by this Project

	Low	Medium	High	Unknown
Erosion Control				
Environmental Impact				
on Nutrient Quality				
Water Quality				

Farm Productivity
Increase

Biodiversity

Soil Health

General comments regarding impact of the technology/methodology employed by this project (open ended):

Lessons Learned

What lessons can be learned from this project? (Select one from three choices)

This project introduced new technology, methodology or information

This project utilized existing technology/methodology with a new application/focus

This project implemented existing technology/methodology

Please list lessons that can be learned from project:

Recommendations for NRCS on Use of Findings

Do project results indicate a need to modify NRCS Practice Standards?

Yes
No
If yes, select the NRCS Practice Standard(s) that need modification and provide your suggested modification:

327: Conservation Cover
328: Conservation Crop Rotation
329: Residue and Tillage Management: No Till/Strip Till/Direct Seed
340: Cover Crop
554: Drainage Water Management
590: Nutrient Management

Do the results indicate a need to change policy or program guidelines? If yes, please provide comments.

Yes
No

Suggested changes and other comments:

Do the results dictate that a publication such as a technology note or job sheet be developed with additional information to promote technology to others and/or incorporated into NRCS manuals, guides and other references?

Yes
No

Suggested materials and other comments:

Are additional outreach efforts recommended to best further disseminate technology?

	Yes	No
Workshops		
Technical Publications		
Journal articles		
Website or Interactive Online Resources such as E-Extension		
Training of staff & partners		
Other: _____		

Are the results transferable to other state or national conservation agencies or programs?

Yes
No

If yes, please list suggested agencies or programs:

<u>Overall Assessment of CIG Project</u>

Should future CIG funding be utilized to support further efforts in this project technology? Select one of the following:

Results of innovative technology employed do not warrant further action; do not repeat efforts

Results are promising, and the concept makes sense; however, the benefits are not clear or clearly documented. Additional work is necessary

Results are promising but identified barriers need to be addressed through future CIG projects and/or other NRCS channels before widespread adoption. (If selected, please complete the question below)

The technology demonstrated through this project should be adopted and incorporated into further NRCS work

Please list general comments:

If 'results are promising but identified barriers need to be addressed' is selected, please comment on the appropriate issues below to provide further clarification (open ended):

Implementation costs
- Comments:

Human capital
- Comments:

Program and policy barriers
- Comments:

Technology inefficiencies
- Comments:

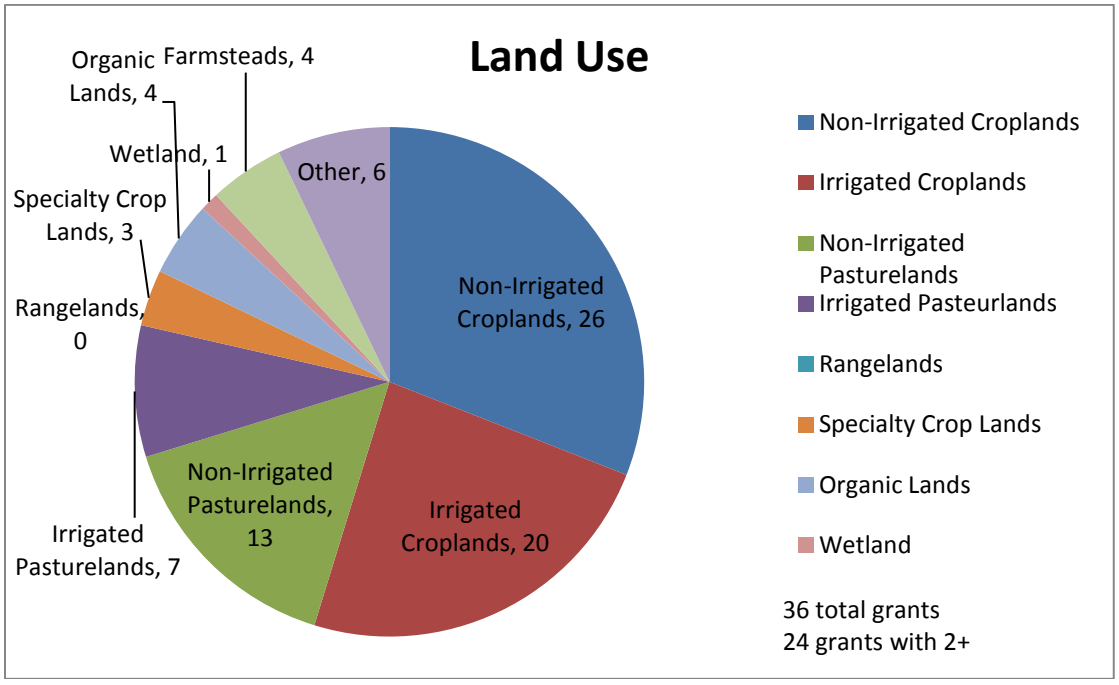
Additional comments or further recommendations regarding this project not addressed elsewhere (open ended):

Appendix B: Summary of Project Reviews by Individual Team Members

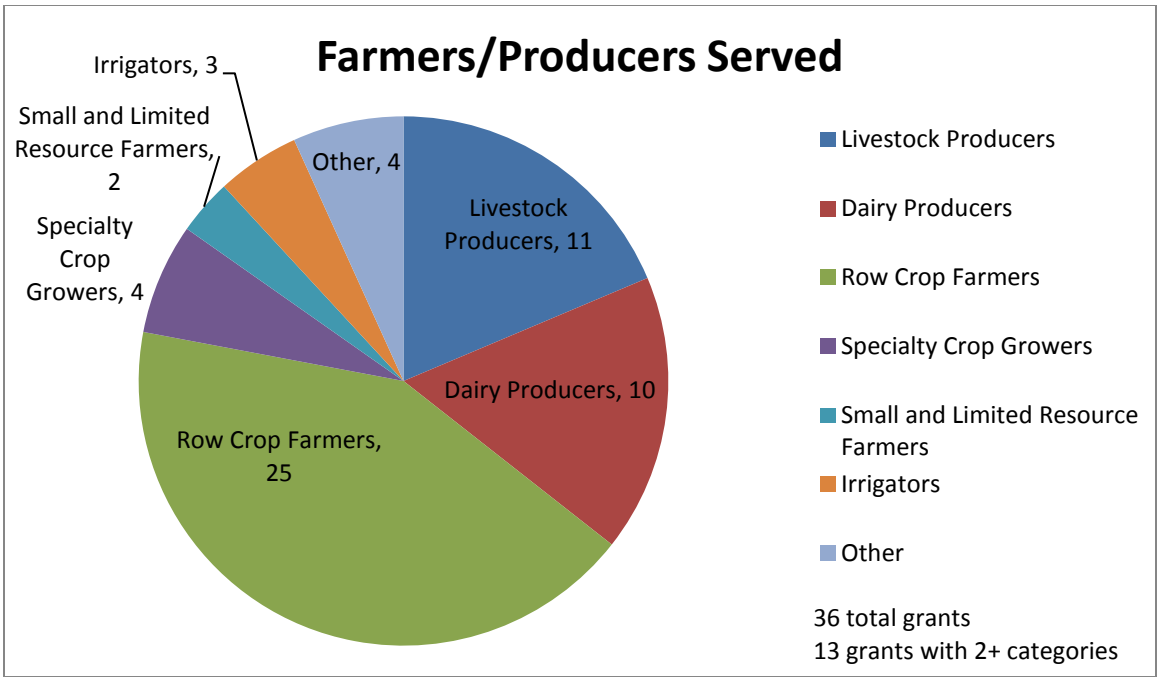
CIG Project Demographics

The demographics of the grants assessed were divided into four main categories: land use, who is served through the project, communication/outreach methods used, and main resource concerns addressed.

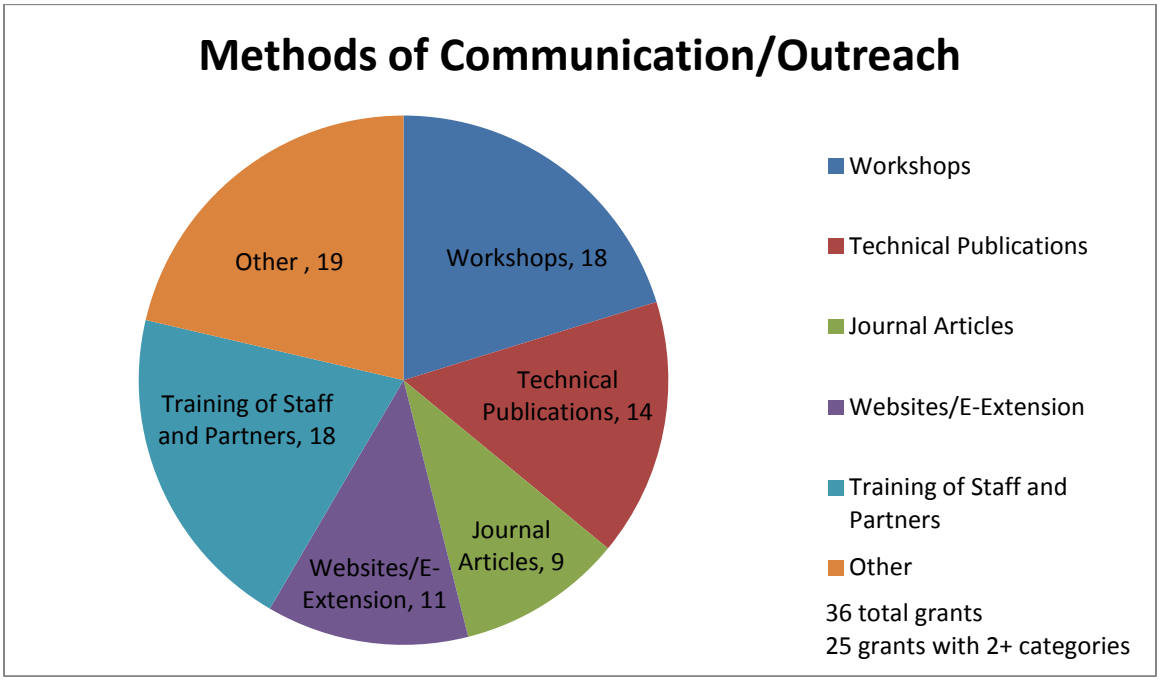
Land use included 26 (72.22%) non-irrigated croplands, 20 (55.56%) irrigated croplands, 13 (36.11%) non-irrigated pasturelands, 7 (19.44%) irrigated pasturelands, 0 (0%) rangelands, 3 (8.33%) specialty crop lands, 4 (11.11%) organic lands, 1 (2.77%) wetland, 4 (11.11%) farmsteads, and 6 (16.67%) classified as "other". Of these grants, 24 (66.67%) fell under two or more land use categories.



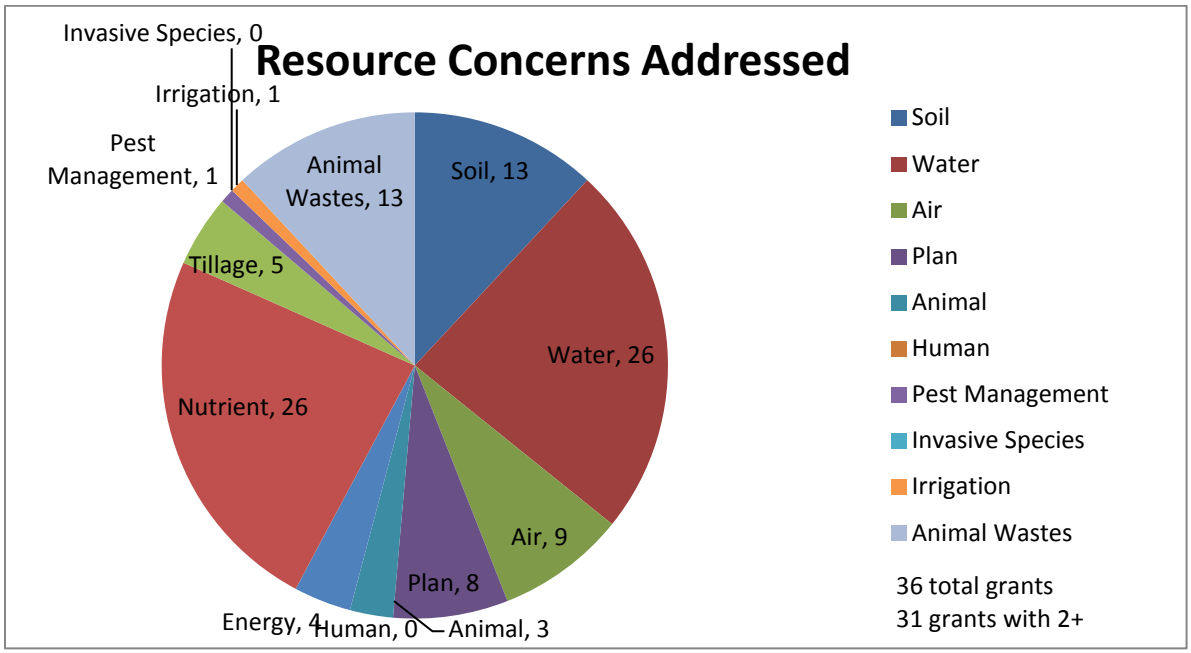
The surveys indicated the following number and percentage of grants served each audience: 11 (30.56%) livestock producers (excluding dairy), 10 (27.78%) dairy producers, 25 (69.44%) row crop farmers, 4 (11.11%) specialty crop growers, 2 (5.56%) small and limited resource farmers, 3 (8.33%) irrigators, and 4 (11.11%) classified as "other". Of these grants, 13 (36.11%) fell under two or more categories for who is served through the projects.



The numbers of grants who employed each of the following six methods of communication/outreach are as follows: 18 (50%) used workshops, 14 (38.89%) used technical publications, 9 (25%) used journal articles, 11 (30.56%) used websites or E-Extension, 18 (50%) used training of staff and partners, and 19 (52.78%) used other methods. Of these grants, 25 (69.44%) used two or more methods of communication or outreach.



Thirteen main resource concerns were addressed through the grants including the following: 13 (36.11%) soil, 26 (72.22%) water, 9 (25%) air, 8 (22.22%) plant, 3 (8.33%) animal, 0 (0%) human, 4 (11.11%) energy, 26 (72.22%) nutrient, 5 (13.89%) tillage, 1 (2.78%) pest management, 0 (0%) invasive species, 1 (2.78%) irrigation, and 13 (36.11%) animal wastes. Of the grants assessed, 31 (86.11%) addressed concerns in two or more categories.



Lessons Learned/New vs. Existing Technology

Conservation Innovation Grants are awarded to implement innovative technologies. Of the grants surveyed 5 (13.89%) used new technology, 14 (38.89%) used existing technology in a new application/focus, and 17 (47.22%) used existing technology. The following lists the types of technology used in each grant under review (see "Red Book" for specific lessons learned):

New Technology:

- State Project: Innovative Precision Manure Management Strategies Using Site-Specific
- Optimizing Manure Nutrient Utilization
- Phosphorous and Solids Removal from Anaerobic Digestion Effluent Through Electrochemical Technology
- State Project: Demonstrating the Efficacy of a Phosphorous Sorbent to Reduce Agricultural Phosphorus Transport to Protect Surface and Ground water Quality
- The Stewardship Index for Specialty Crops

Existing Technology in a new application/focus:

- Nitrogen Loss Reduction in Crops
- Pilot-Testing Performance-Based Incentives for Agricultural Pollution Control
- Transitioning to No-Till Cover Crops

- Precision Agriculture on Grasslands
- Precision Feeding to Reduce Nutrient Losses from Virginia Dairy Farms
- Water Quality Trading
- Phosphorous Control in Farm Waste Management
- Improving Nutrient Use and Creating Value-Added Products for Dairy Farmers
- Precision Dairy Feeding to Reduce Nutrient Pollution in Pennsylvania's Waters and the Chesapeake Bay
- Subsurface Drainage Water Management
- Chesapeake Nutrient Neutral Fund
- Demonstration of Enhanced Technologies for Land Application of Animal Nutrition Sources in Sensitive Watersheds
- Quantitative Comparison of the Effects of Controlled Drainage versus Constructed Wetlands on Water Quality at a Watershed Scale
- State Project: The Web Soil Survey

Existing Technology:

- Cooperative Conservation for Watershed Health
- Nitrogen Management During Corn Production
- WV Potomac Nutrient Credit Bank and Trade Program
- Controlling Odor and Nutrient Losses
- Demonstration of Innovative Technology for Optimizing Nitrogen Application on Corn
- Outcomes Based Nitrogen Efficiency Project for Corn Production
- State Project: Advancing Farmer-Friendly, highly Effective Nutrient Use Efficiency
- State Project: The Use of Precision Ag in Cumberland and Salem Counties
- Creating and Quantifying Carbon Credits from Voluntary Practices on Rice Farms in the Sacramento Valley
- State Project: Using GPS and VRT for precise implement guidance and fertilizer application to reduce nutrient loading in the environment
- On Farm Evaluation and Demonstration of Ammonia Reduction BMP for Feedlots and Dairies
- Power from the Prairie
- Conservation and Integrated Pest Management
- Chesapeake Water Quality Initiative
- Managing Poultry-Source Nutrient Delivery
- Quantification of Impacts of On-Farm Water Capture, Storage and Re-Use of Surface Water on Water Quantity and Water Quality
- Pilot Project for Value-Added Product Development from Solid Waste Generated on Swine Farms

Overall Findings

The overall findings of the Conservation Innovation Grants varied widely between suggestions to not repeat, address barriers before adoption, continue with additional work to identify benefits, as well as adopt individual grants/technologies/practices. Suggestions to not repeat several of the grants stemmed from unclear objectives, need for more sophisticated analysis, need to implement at regional level rather than state, and inconclusive results. One review mentioned a grant was given to a company that was clearly looking for start up money. Barriers to adoption included cost analysis, human capital, lack of research, and policies. Reviews which indicated a need to identify benefits through additional work were in need of more information in the grant reports such as with costs, implementation, and areas which technology could be applied. Finally, the reviews which indicated NRCS should adopt the project or technology often still indicated that certain policy barriers also needed addressed or that there was a need for additional information. Some of these technologies are already being used or would be more relevant for private industry. Overall, further information is needed for most grants especially in regards to cost and more research should be conducted in many of the fields. See this section in the "Red Book" for further comments.

Cost Effectiveness

Cost effectiveness was difficult to determine in many of the grants assessed. Often fund sourcing or the actual cost was unclear. The cost of using existing technology proved to lower the cost of the project, such as with the Web Soil Survey, and other grant reviews also indicated that the costs were either low and/or effective in their use. Several of the grant reports which did not include sufficient information to clearly state the cost effectiveness were reasoned to be very costly. Other grant reviews indicated the technology is not beneficial or the cost of implementing the technology severely outweighed the benefits the technology offers.

	Low	Medium	High	Unknown
Costs to Producer	7	12	6	11
Program Costs	4	13	6	13
Delivery Costs	7	10	7	12

The cost effectiveness of each grant was assessed for three categories, cost to producer, program cost, and delivery cost. Each of these was assessed on a high, medium, low, or unknown basis. The grants were determined to have 7 (19.44%) low, 12 (33.33%) medium, 6 (16.67%) high, and 11 (30.56%) unknown costs to producer. The program costs were determined as 4 (11.11%) low, 13 (36.11%) medium, 6 (16.67%) high and 13 (36.11%) unknown. The delivery costs were determined as 7 (19.44%) low, 10 (27.78%) medium, 7 (19.44%) high, and 12 (33.33%) unknown.

Impacts

The impact each grant had on erosion control, the environment, water quality, farm productivity increase, biodiversity, and soil health was assessed in each survey on a scale of high, medium, low, and unknown.

As with many of the areas reviewed in the Conservation Innovation Grants, the impacts the grants had on erosion control, the environment, water quality, productivity, biodiversity, and soil health proved difficult to determine from the grant reports. Many reviews indicated insufficient data was given to determine the impact for specific categories given in the review and/or the overall grant. Still, others noted much of the technology in the grants is very impactful and could be more effective with more acceptance from producers and consumers. The reviews which indicated certain grants would not have a great impact mentioned lack of sustainability, scale-up potential or widespread impact.

Sixteen (44.44%) surveys indicated low, 3 (8.33%) medium, 3 (8.33%) high, and 14 (38.89%) unknown impacts on erosion control. Seven (19.44%) surveys indicated low, 12 (33.33%) medium, 10 (27.78%) high and 7 (19.44%) unknown environmental impacts. Six (16.67%) surveys indicated low, 14 (38.89%) medium, 9 (25%) high, and 7 (19.44%) unknown impacts on water quality. Six (16.67%) surveys indicated low, 10 (27.78%) medium, 6 (16.67%) high and 14 (38.89%) unknown impacts on farm productivity increase. Eleven (30.56%) surveys indicated low, 1 (2.78%) medium, 0 (0%) high and 23 (63.89%) unknown impacts on biodiversity. Nine (25%) surveys indicated low, 2 (5.56%) medium, 2 (5.56%) high and 23 (63.89%) unknown impacts on soil health.

Development of Publication/Technology to Promote Technology

Fourteen (38.89%) surveys indicated a need for a publication such as a technology note or job sheet be developed with additional information to promote technology to others and/or incorporated into NRCS manuals, guides and other references. A total of 22 (61.11%) indicated no need for this, however 10 (27.78%) also included comments.

The Conservation Innovation Grant reviews indicated several key concepts, if consumers/producers do not accept the technology then it will not be implemented, technical notes or manuals for use at the state or national level explaining the details of the technology as well as the challenges incurred with implementation would be beneficial for thorough understanding, more information needs to be included in the reports to determine if further development of a publication/technology would be useful, and finally that many grants did include a publication which was made available with the technology. The following surveys indicated a need for a publication as listed below:

- Nitrogen Management During Corn Production – NRCS manuals/guides on “problem solving or HOW and WHY”
- Precision Agriculture on Grasslands – Tech note on precision fertilization in pasturelands for local offices
- Precision Feeding to Reduce Nutrient Losses from Virginia Dairy Farms – adopting feed management software into tech note
- State Project: Advancing Famer-Friendly, highly Effective Nutrient Use Efficiency – state level 590 job sheet for producers and local NRCS to understand the process used
- Phosphorous Control in Farm Waste Management – if changes to guidelines are made then create tech note
- Improving Nutrient Use and Creating Value-Added Products for Dairy Farmers – Tech note on the challenges to installing a similar system

- Creating and Quantifying Carbon Credits from Voluntary Practices on Rice Farms in the Sacramento Valley – online calculator to determine benefits of technology
- Demonstration of Enhanced Technologies for Land Application of Animal Nutrition Sources in Sensitive Watersheds – tech sheet on subsurface application options for swine manure
- On Farm Evaluation and Demonstration of Ammonia Reduction BMP for Feedlots and Dairies – several factsheets are being developed according to the report
- Conservation and Integrated Pest Management – the more information available to the producers and researchers the more likely the technology is to be adopted on a wider scale
- Chesapeake Water Quality Initiative – publication showing cost effectiveness for more producer acceptance of technology
- Quantification of Impacts of On-Farm Water Capture, Storage and Re-Use of Surface Water on Water Quantity and Water Quality – stimulated more research, but has unknown cost
- State Project: The Web Soil Survey – develop tech note and compensate those who use the tech. *(PLEASE NOTE: This recommendation is included in Appendix B as part of the project reviews by individual team members; however, based on discussions at the review team meeting, the reviewer no longer recommends that a tech note is needed.)*
- Pilot Project for Value-Added Product Development from Solid Waste Generated on Swine Farms – fact sheet on misconceptions of composted animal wastes to increase consumer acceptance and demand

Replication and Applicability

The ability to replicate and apply the technology or programs used in the Conservation Innovation Grants which were reviewed shows the effectiveness of each grant and its usefulness to the program as well as the industry. This ability is different for each grant, however 14 (38.89%) grants indicated a high tech ease of replication, 14 (38.89%) indicated a medium tech ease of replication, and 4 (11.11%) indicated a low tech ease of replication. The grants also differ in the usage applicability, land use transferability, and scale of applicability. Most grants appeared applicable in some manner. The following list gives a brief overview of the comments given in regards to replication and applicability of each project.

- Cooperative Conservation for Watershed Health: Missing information
- Nitrogen Management During Corn Production: Farmers lack industry support for tools
- Nitrogen Loss Reduction in Crops: Reasonably successful and impactful technology
- WV Potomac Nutrient Credit Bank and Trade Program: Need to develop trading rules
- Controlling Odor and Nutrient Losses: Conclusions would be premature
- Pilot-Testing Performance-Based Incentives for Agricultural Pollution Control: Tools may not be useful
- State Project: Innovative Precision Manure Management Strategies Using Site-Specific Management Zones for Enhancing Water Quality and Sustaining Productivity: Not enough information
- Demonstration of Innovative Technology for Optimizing Nitrogen Application on Corn: Not profitable to farmers
- Transitioning to No-Till Cover Crops: Cover crops need to be adopted

- Precision Agriculture on Grasslands: Simple concept, suggests zone approach
- Optimizing Manure Nutrient Utilization: Limitation from manure handling system
- Outcomes Based Nitrogen Efficiency Project for Corn Production: applicable to corn and soybeans
- Precision Feeding to Reduce Nutrition Losses from Virginia Dairy Farms: Medium applicability assuming dairies feed similar ratios through the U.S.
- State Project: Advancing Farmer-Friendly, highly Effective Nutrient Use Efficiency: Most applicable for corn
- State Project: The Use of Precision Ag in Cumberland and Salem Counties: Already in use
- Water Quality Trading: Versatile but must be calibrated
- Phosphorus Control in Farm Waste Management: Need to identify local source of mine drainage residuals then apply concepts
- Improving Nutrient Use and Creating Value-Added Products for Dairy Farmers: Difficult to apply elsewhere, limited by temperature and cost prohibitive
- Phosphorus and Solids Removal from Anaerobic Digestion Effluent Through Electrochemical Technology: High level of skill required, difficult broad application
- Precision Dairy Feeding to Reduce Nutrient Pollution in Pennsylvania's Waters and the Chesapeake Bay: Intensive monitoring required with additional costs
- Creating and Quantifying Carbon Credits from Voluntary Practices on Rice Farms in the Sacramento Valley: Can be used generally in CA but requires calibration
- State Project: Using GPS and VRT for Precise Implement Guidance and Fertilizer Application to Reduce Nutrient Loading in the Environment: Used nationwide
- Subsurface Drainage Water Management: Need positive results from a well-constructed experiment first
- Chesapeake Nutrient Neutral Fund: Currently has no plan for the goals established
- Demonstration of Enhanced Technologies for Land Application of Animal Nutrition Sources: General principles can be applied to other regions
- On Farm Evaluation and Demonstration of Ammonia Reduction BMP for Feedlots and Dairies: Easy to replicate
- Power from the Prairie: Does not recommend replication
- State Project: Demonstrating the Efficacy of a Phosphorus Sorbent to Reduce Agricultural Phosphorus Transport to Protect Surface and Ground Water Quality: Applicable to area surrounding urban setting with water treatment plant
- Quantitative Comparison of the Effects of Controlled Drainage versus Constructed Wetlands on Water Quality at a Watershed Scale: Could be replicated if found helpful
- Conservation and Integrated Pest Management: Practiced throughout the world
- Chesapeake Water Quality Initiative: Cost would be a limiting factor
- Managing Poultry-Source Nutrient Delivery: Applicable but not cost effective
- Quantification of Impacts of On-Farm Water Capture, Storage, and Re-Use of Surface Water on Water Quantity and Water Quality: only applicable in certain climates
- The Stewardship Index for Specialty Crops: Adaptable but must be adjusted
- Pilot Project for Value-Added Product Development from Solid Waste Generated on Swine Farms: Applicable with CAFO's which are not able to land apply

Transferable Results

Twenty-two (61.11%) surveys indicated transferable results to other state or national conservation agencies or programs. A total of 14 (38.89%) indicated no transferable results, however three (8.33%) comments were included. The reviews of the following grants indicated transferable results to the given agency or other organization.

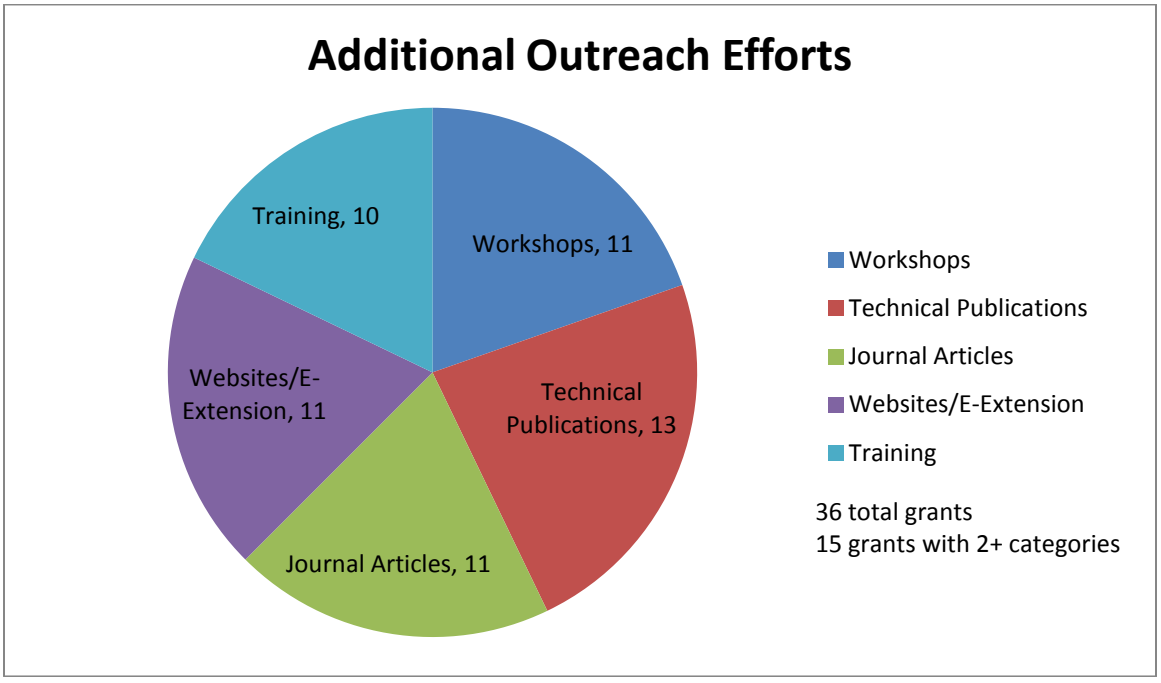
- Nitrogen Management During Corn Production: Pull groups working on N sensors together with CIG grants
- Nitrogen Loss Reduction in Crops: No comment
- Demonstration of Innovative Technology for Optimizing Nitrogen Application on Corn
- Transitioning to No-Till Cover Crops: Conservation tillage groups around the area
- Precision Agriculture on Grasslands: Conservation districts in the region
- Outcomes Based Nitrogen Efficiency Project for Corn Production: Conservation districts and other local entities in the corn belt
- Precision Feeding to Reduce Nutrient Losses from Virginia Dairy Farms: State DEQ's that regulate CAFO's
- State Project: Advancing Famer-Friendly, highly Effective Nutrient Use Efficiency: Conservation districts or local resource agencies
- State Project: The Use of Precision Ag in Cumberland and Salem Counties: Where guidance technology is not readily adopted
- Water Quality Trading: Agency focused on reduction of nutrient losses
- Phosphorous Control in Farm Waste Management: Programs to effectively manage waste, possibly beyond agriculture
- Improving Nutrient Use and Creating Value-Added Products for Dairy Farmers: Areas with colder temperature cannot use this technology
- Phosphorous and Solids Removal from Anaerobic Digestion Effluent Through Electrochemical Technology: Not certain
- Precision Dairy Feeding to Reduce Nutrient Pollution in Pennsylvania's Waters and the Chesapeake Bay: No comment
- Demonstration of Enhanced Technologies for Land Application of Animal Nutrition Sources in Sensitive Watersheds: Extension, Soil Conservation Districts
- On Farm Evaluation and Demonstration of Ammonia Reduction BMP for Feedlots and Dairies: Extension, Soil Conservation Districts
- State Project: Demonstrating the Efficacy of a Phosphorous Sorbent to Reduce Agricultural Phosphorus Transport to Protect Surface and Ground water Quality: Universal
- Conservation and Integrated Pest Management: DOW, EPA, anyone dealing with nutrient issues in water bodies
- Chesapeake Water Quality Initiative: DOW, EPA, anyone dealing with water quality issues
- Quantification of Impacts of On-Farm Water Capture, Storage and Re-Use of Surface Water on Water Quantity and Water Quality: Army Corps of Engineers, USGS, ARS, Dept. of Wildlife
- State Project: The Web Soil Survey: EPA, State Dept. of Water

- Pilot Project for Value-Added Product Development from Solid Waste Generated on Swine Farms: Dept. of Soil and Water, State departments of natural resource

Additional Outreach Efforts

Additional outreach efforts that could be employed to better the success of the project associated with the grant were categorized under six headings. 11 (30.56%) surveys indicated workshops could be employed, 13 (36.11%) technical publications, 11 (30.56%) journal articles, 11 (30.56%) websites or E-Extension, 10 (27.77%) training. Seventeen comments were given (42.78%). Fifteen (41.67%) of the surveys indicated two or more additional outreach efforts.

Comments on additional outreach efforts that could be used for the grants reviewed indicated a general finding, more information to the consumer, producer, and scientific community is often best. Many of the reviews indicated the grant recipients did a good job in reaching out to all of the pertinent audiences and were very thorough. Several did indicate as more research is done in each particular area that the knowledge should be shared in order to create more acceptance and use of the practice. In order for these practices and technologies to be adopted it is important that all involved in the process fully understand the concept and the results are clearly visible. The following chart shows the types of additional outreach efforts that were suggested through the grant reviews.



Policy/Program Guideline Changes

Nine surveys (25%) indicated a need for policy or program guideline changes while 27 surveys (75%) indicated no need for change.

Like many of the other areas looked at in this review of Conservation Innovation Grants, recommendations vary depending on the grant being reviewed. Many indicated in their reviews that policy or program guidelines do not need to be changed or that results/reports were not sufficient enough to make a proper determination. Many also included that several of these technologies or programs could not be implemented in other regions or are not accepted in a widespread manner and therefore should not be mandated. Of the policy or program guideline suggestions to change there were several suggestions to make it easier for farmers to have the ability to use the technology such as flexibility or less regulatory hurdles as well as more research done on projects such as phosphorus transport and retention. One last comment from a reviewer questions the scope of the accepted CIG grants and which are funded. Overall the majority of grant reviews does not recommend policy or program guideline changes.

The following grants indicated a need for policy/program guideline changes:

- Cooperative Conservation for Watershed Health
- Controlling Odor and Nutrient Losses
- Transitioning to No-Till Cover Crops
- Optimizing Manure Nutrient Utilization
- Outcomes Based Nitrogen Efficiency Project for Corn Production
- Phosphorous Control in Farm Waste Management
- On Farm Evaluation and Demonstration of Ammonia Reduction BMP for Feedlots and Dairies
- Power from the Prairie
- State Project: Demonstrating the Efficacy of a Phosphorous Sorbent to Reduce Agricultural Phosphorus Transport to Protect Surface and Ground water Quality

Practice Standards Addressed

The United States Department of Agriculture Natural Resources Conservation Service issued practice standards involved in each grant assessed was identified in order to assess the grants on a uniform basis. The following practice standards were identified as having relevance to particular grants: practice standard 327 (4 grants, 11.11%), practice standard 328 (3 grants, 8.33%), practice standard 329 (5 grants, 13.89%), practice standard 340 (4 grants, 11.11%), practice standard 554 (6 grants, 16.67%), practice standard 590 (30 grants, 83.33%). Of the grants assessed, 9 (25%) were indicated as having relevance to two or more practice standards.

Practice Standard	327	328	329	340	554	590
Number of relevant grants (total of 36 grants reviewed)	4	3	5	4	6	30

The need for modification of practice standards was also addressed in the reviews. Practice standard 590 was indicated in five (13.89%) separate surveys as needing modification

and practice standards 329 and 340 were each indicated once respectively (2.78%) as needing modification. Modifications are specific to each individual grant. The following comments were given with practice standard modification suggestions:

Practice Standard 329:

- Transitioning to No-Till Cover Crops: No Till/Strip Till/Direct Seed Possible inclusion including cover crops

Practice Standard 340:

- Transitioning to No-Till Cover Crops: Cover Crop Mention of no till technology

Practice Standard 590:

- Nitrogen Loss Reduction in Crops: It isn't clear to me that NRCS should be funding sensor technology for farmers
- Outcomes Based Nitrogen Efficiency Project for Corn Production: Allow for more flexibility based upon post season evaluation tools
- Precision Feeding to Reduce Nutrient Losses from Virginia Dairy Farms: Reference the software utilized in 592
- Phosphorus Control in Farm Waste Management: Allow appropriate amendments that can reduce the phosphorus source coefficient
- Demonstrating the Efficacy of a Phosphorus Sorbent to Reduce Agricultural Phosphorus Transport to Protect Surface and Ground Water Quality: Worth exploring

Should future CIG funding be utilized to support further efforts in this project technology?

The reviewer was asked to determine if efforts warranted further action and CIG support; if results were promising but additional work is necessary to clarify benefits or for documentation; if results were promising but barriers (and if so, what barriers) needed to be addressed; or if the technology in the project was ready for adoption and incorporation into NRCS work. Following is a summary of responses and related comments; however, more detailed comments may be found about each project in the overall findings section of the "Red Book."

The assessment was that the results of innovative technology employed by the following projects do not warrant further action and recommend that efforts not be repeated:

- **WV Potomac Nutrient Credit Bank and Trade Program**
- **Pilot-Testing Performance-Based Incentives for Agricultural Pollution Control** (It would take a much more sophisticated analysis - significant increase in funding and project duration - to really explore the appropriateness of performance-based incentives. In addition, tools to quantify pollutant reductions would have to be more reliable, and the economic analysis would have to be more complex before the true costs/benefits of this type of programming could be ascertained.)
- **State Project: Innovative Precision Manure Management Strategies Using Site-Specific Management Zones for Enhancing Water Quality and Sustaining Productivity**

- **Subsurface Drainage Water Management** (Replicate field research. Results were inconclusive.)
- **Chesapeake Nutrient Neutral Fund** (I think once the foundation has a firm set of plans on what to do, and measurements that support that the changes will make any difference, and a sampling protocol to document improvements, I think additional efforts are pointless.)
- **Power from the Prairie** (The information on the nutrient content of a couple grasses and the feed and energy value of the grasses was certainly not worth $229,000. The company was clearly looking for start up money for their bio-gas idea.)
- **Managing Poultry-Source Nutrient Delivery** (Hydromodification did not create any measurable differences in nutrient concentrations. Algal turf scrubber did capture some nutrients, however at a great cost and could not discern the amount of area influenced by this practice. It states at one time "approximately 230 to 350 lbs N and 35-40 lbs P per acre were being removed by the system. I don't understand these values, since the N values would be higher than I would think would be applied to most crops produced.)

The assessment was that results are promising, and the concept makes sense; however, the benefits are not clear or clearly documented for the following projects, and it is recommended that additional work is necessary:

- **Controlling Odor and Nutrient Losses** (Additional and similar experiments should be run in different agroecological regions with different animal wastes in order to better determine the air, water and yield tradeoffs in these application systems. More data needed to select between the different systems.)
- **Water Quality Trading** (I think more information in the report would allow reviewers to more decisively determine if additional work is truly needed.)
- **Improving Nutrient Use and Creating Value-Added Products for Dairy Farmers** (Because the cost is so high from a business standpoint, a better analysis that indicates what the environmental benefit are may be necessary.)
- **Phosphorous and Solids Removal from Anaerobic Digestion Effluent Through Electrochemical Technology** (The authors indicated that efforts are on-going for further validation with a new CIG grant. I believe that while the technology has potential, the cost and high level of skill needed to operate the system makes it prohibited for application at this time. I believe this kind of project would be better supported by other efforts.)
- **State Project: Using GPS and VRT for precise implement guidance and fertilizer application to reduce nutrient loading in the environment** (VRT and GPS technologies are being used in diverse settings to try to improve nutrient applications. The potential application of these technologies is worth pursuing further.)
- **Demonstration of Enhanced Technologies for Land Application of Animal Nutrition Sources in Sensitive Watersheds** (Implementation costs: High cost of equipment. Human capital: More complicated than present grower activities)
- **Chesapeake Water Quality Initiative** (Same as previous, this is one tool that can be utilized to reduce potential N loading to sensitive watershed. There are many other "tools", proven by land grant institutions, that should be also considered. A cost

comparison between the many "tools" would be helpful to get the practices implemented.)

- **The Stewardship Index for Specialty Crops** (The producer must see some benefit to reporting all the additional information requested. It was not possible to determine if sustainable performance was achieved. Incentivizing adoption of data collection and adoption is necessary for this to be successful. The project asked too much in this grant out of producers for it to be widely accepted. Of the 110 producers that agreed to participate in the project, only 38 completed what was asked of them.)

The assessment was that results are promising for the following projects but certain barriers need to be addressed through future CIG projects and/or other NRCS channels before widespread adoption as identified below:

- **Nitrogen Loss Reduction in Crops** (This technology has shown promise in multiple locations. Funding is needed, however, for university personnel to develop the appropriate algorithms for the technology. Not all state research agronomist/soil scientist have those resources. Several large CIG projects organized by agroecological regions and involving university agronomist could ensure coverage of this technology throughout the US. A full cost analysis should be conducted (this was only a partial budget analysis) for each agroecological region. Finally, there are reports that often farmers are insufficiently supported by equipment dealers to use the sensor technology well. This problem should be addressed. Implementation costs: Need a full budget Technology inefficiencies: Equipment providers due not provide sufficient service)
- **Demonstration of Innovative Technology for Optimizing Nitrogen Application on Corn** (Some states have developed significant information for sensor technology and N application and others have not. Regional projects might spur development of the appropriate technologies.)
- **Optimizing Manure Nutrient Utilization** (Implementation costs: not complete from report Program and policy barriers: grantee had problems with state policy to implement)
- **Outcomes Based Nitrogen Efficiency Project for Corn Production** (Implementation costs: Human capital mentioned below can be costly as local/state/federal funding is usually short. Human capital: This kind of effort requires good partnerships and 'boots on the ground' to work.)
- **Phosphorous Control in Farm Waste Management** (The technology shows promise. Some of the barriers that would need to be address for specific locations is the potential for P fixation beyond what is intended with the amendment that can cause crop yield reductions; the use of appropriate amendments that do not create toxicity or build up of hazardous materials; the added cost of adding such amendments to animal waste. Implementation costs: Cost sharing structures will likely be needed to offset the added cost of handling Program and policy barriers: The use of waste hazardous materials from mines is a major concern. Identification of appropriate amendments would need to be determined on a source by source basis.)

- **Precision Dairy Feeding to Reduce Nutrient Pollution in Pennsylvania's Waters and the Chesapeake Bay** (Implementation costs: The biggest issue is related to feed costs that are volatile in nature.)
- **Creating and Quantifying Carbon Credits from Voluntary Practices on Rice Farms in the Sacramento Valley** (Implementation costs: It would be necessary to better understand the costs associated with changes in practices. Some of the factors should include soil conservation costs, diversity costs (no flooded fields for fowls and potential extra revenue associated with hunting), cost or savings related to other agricultural inputs (fuel, equipment, fertilizers, herbicides, etc.).)
- **State Project: Demonstrating the Efficacy of a Phosphorous Sorbent to Reduce Agricultural Phosphorus Transport to Protect Surface and Ground water Quality** (Additional experiments with these and associated materials would be worthwhile and would help to validate their use in reducing P release to ground/surface water.)
- **Quantitative Comparison of the Effects of Controlled Drainage versus Constructed Wetlands on Water Quality at a Watershed Scale** (The project needs to survey nutrient inputs into the system and relate groundwater sampling results to differences observed. Before wanting to compare controlled drainage with wetlands, perhaps it would be good to choose a watershed where controlled drainage would actually be practical?)
- **State Project: The Web Soil Survey** *(PLEASE NOTE: This project was originally recommended for adoption by the reviewer but based on discussions at the review team meeting it was determined that barriers needed to be addressed before widespread adoption.)*

The assessment was that the technology demonstrated through the following projects should be adopted and incorporated into further NRCS work.

- **Cooperative Conservation for Watershed Health** (Comprehensive watershed planning should become part of standard operating procedure for when water quality protection is the objective of conservation practice implementation.)
- **Nitrogen Management During Corn Production** (Actually in-season tools are already written into the standard)
- **Transitioning to No-Till Cover Crops** (Seems like the outreach approach in this project is more important to promote and repeat than the technology itself.)
- **Precision Agriculture on Grasslands**
- **Precision Feeding to Reduce Nutrient Losses from Virginia Dairy Farms**
- **State Project: Advancing Famer-Friendly, highly Effective Nutrient Use Efficiency** (Would like to have seen additional data to backup text in report.)
- **State Project: The Use of Precision Ag in Cumberland and Salem Counties (**In our area, guidance technology is becoming common practices without programs.)
- **On Farm Evaluation and Demonstration of Ammonia Reduction BMP for Feedlots and Dairies**
- **Conservation and Integrated Pest Management** (I am not sure of the barriers hindering implementation, but there must be something that was not detected in the report. I think additional studies like this that show the benefits and increase

productivity would go a long way to have a higher rate of implementation in the area.)

- **Quantification of Impacts of On-Farm Water Capture, Storage and Re-Use of Surface Water on Water Quantity and Water Quality** (I check this box with hesitation. From what I could glean from the report, it appeared to be successful and useful. I think it could be adapted into certain regions and provide useful information, but only in certain regions, not a blanket adaption. The unknown cost of the project might be a limiting factor for wide scale adaption.)
- **State Project: The Web Soil Survey** *(PLEASE NOTE: This recommendation is included in Appendix B as part of the project reviews by individual team members; however, based on discussions at the review team meeting that the Web Soil Survey is not adequately scaled to the field level to allow for more accurate fertilizer rates and placement, the reviewer no longer recommends this for wide-spread adoption unless barriers are addressed.)*
- **Pilot Project for Value-Added Product Development from Solid Waste Generated on Swine Farms** (The technology should and will be adapted if adequate market is available for the end product. I think it is a good option if identified end users are willing and able to use the final product. The largest barrier is saturating the market and the market appears to be hindered by consumer acceptance. The concepts work and are good, but if there is no define end user (or they are maxed out), then this would not be beneficial.)

Appendix C: CIG Assessment Review Team Meeting Agenda

CIG Assessment Review Team Meeting
July 10-11, 2013
Crystal City, Virginia
PARTICIPANT LIST

Review Team:
Troy Bauder, Colorado State University
Fabián Fernandez, University of Minnesota
Dave Franzen, North Dakota State University
Deanna Osmond, North Carolina State University
Edwin Ritchey, University of Kentucky

Other Attendees:
Luther Smith, ASA and CIG Assessment Grant Project Director
John Davis, NRCS CIG Program Technical Contact
Bruce Knight, Strategic Conservation Solutions, LLC
Julie Knight, Strategic Conservation Solutions, LLC
Elizabeth Griswold, Strategic Conservation Solutions, LLC

AGENDA

Day 1

12:00 noon — Welcome and Introductions/Get-Acquainted
(Lunch Provided)

1:00 - 2:45 — Overview of Final Reports (Presented by Review Team)
- Deanna Osmond
- Troy Bauder
- Fabián Fernandez

2:45 - 3:00 — Phone Break

3:00 - 4:15 — Continue Review of Final Reports
- Dave Franzen
- Edwin Ritchey

4:30 - 5:30 — Recap and Reactions
- Initial Observations and Feedback on CIG Program
- Identify Potential "Most Promising"

5:30 — Adjourn
6:10 — Depart for Dinner Reservation at 6:30 (Skydome Lounge Revolving Restaurant)

CIG Assessment Review Team Meeting

Day II

7:30 - 8:00 CIG Project Effectiveness
- Cost Effectiveness
- Impact (erosion control, environmental, water quality, biodiversity, soil)

8:00 - 9:30 Review of Practice Standards Addressed and Recommendations for Modification
- 327
- 328
- 329
- 340
- 554
- 590

9:30 - 9:45 Break

9:45 - 10:15 Recommendations for Policy/Program Guideline Changes

10:15 - 11:00 Recommendations for Adoption
- Technologies and Practices
- Replicability, Applicability, Transferability
- Additional Outreach and Technical Publications

11:00 - 11:30 Overall Findings and Summary Thoughts

11:30 - 12:00 Next Steps on CIG Assessment Project
- Report writing
- Presentations (NRCS and ASA)
- Potential journal articles
- Transfer to ASA Network:
  - *Crops and Soils*
  - Additional opportunities

12:00 noon Adjourn

Meeting Location Information:

Embassy Suites Hotel Chrystal City-National Airport
1300 Jefferson Davis Highway, Arlington, VA
703-979-9799