



**PLANNING AND CONDUCTING SCHEDULED ONSITE
REVIEWS OF UNIT RESEARCH**

**USDA-Agricultural Research Service
Northern Plains Area Protocol**

Revised November 2008

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Introduction

The U.S. government invests more than \$2 billion in agricultural research each year, over half of that through ARS, expecting in return that ARS will develop new knowledge and improved technology. For ARS to succeed with its mission, we must be viewed by our peers, partners, stakeholders and customers as leaders who solve problems important to American agriculture through research that is relevant and of the highest quality.

Background: In 1993 Congress passed the Government Performance and Results Act (GPRA), which required federal agencies to set strategic goals and use performance measures for management and budgeting. For ARS, this meant moving from an output- to an outcome-driven organization, which required greater efficiency, effectiveness, and accountability in our programs and spending.

In 1998 Congress passed a Farm Bill (Public Law 105-185), which mandated that each ARS-proposed research project be reviewed every five years by an external panel of scientists. ARS formed the Office of Scientific Quality Review (OSQR) to coordinate the peer-review process and established a new process to plan, review and evaluate research in response to this legislation. In addition, ARS's Office of National Programs (ONP) now define research objectives at the national level and for each individual project.

Purpose: The Expert Review of Unit Research Program is a management tool used within the Northern Plains Area (NPA) to strengthen the research and operations of NPA Units. It supplements OSQR's prospective review of individual projects with a retrospective assessment of entire Units. Expert reviews assist Units to:

- assess their own progress in accomplishing goals and objectives
- continue strategic planning
- prepare for the upcoming OSQR peer-review cycle
- gain fresh perspective on Unit strengths and develop additional capacity

The purpose of this Expert Review is to engage a panel of experts to assess the Unit's research programs with regard to the factors below (also see Final Panel Report section):

1. Research Performance
2. Research Quality
3. Research Capacity
4. Research Leadership

Expected Outcomes: We expect that the Panel will recommend actions that can be taken by the Unit to improve its research programs; that the Unit will consider all the Panel's recommendations and implement them appropriately; and that the quality and relevance of NPA research will be optimized and Unit operations improved.

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Preparing for the Review

Panel selection: Selecting the Review Panel is a crucial step in preparing for the review. The Panel selection process must strive for balance between having the most knowledgeable and most independent individuals serve as members. Real or perceived conflicts of interests are to be avoided in nomination and selection of Panelists.

The Unit, in collaboration with appropriate National Program Leaders (NPL) submits candidate names to the Area Director (AD) for Panel Chair and members at least **nine months** prior to the review date; more lead time will increase the probability of obtaining first-choice individuals. The Unit and ONP are encouraged to nominate qualified minorities and women to serve on Review Panels. The Area Office will schedule a teleconference with the Unit Research Leader (and Center Director where appropriate) and ONP to discuss the candidates and finalize the priorities. After the Panel Chair has been selected by the AD and the Chairperson has agreed to serve, the Area Office will consult with the Chairperson on suggested Review Panel members.

The Panel members (usually 4 to 6) are to be mostly non-ARS experts who can provide an objective, unbiased assessment of the Unit's research program. (The Review Panel will be composed of external reviewers from academia, industry, or government.) Inclusion of one ARS panelist has proven helpful in the Panel's understanding of ARS operations. Logistics and coordination problems increase rapidly if the team is larger. Thirty days in advance of the review, the RL/LD/CD should bring any important issues to the attention of the Area Office and ONP so that they can be discussed in advance.

The following criteria are suggested when selecting potential Panel members:

1. Panel members should be well respected by their colleagues and professionally active, with training and experience in their specialty areas.
2. Panel members should provide a balance among sub-disciplines, functions, and points of view. International scientists may, if deemed important by the Unit, Area Office, or ONP, be appointed to the Review Panel.
3. **Panel members should *not* have** co-authored papers, conducted or planned research (including that planned in grant proposals), supervised or been supervised by any employee of the Unit during the past four years.

The Area Office may schedule a conference call with the RL/LD/CD to discuss planning for the review and any special circumstances. As soon as the Panel members have been confirmed the Area Office will send each a copy of this document, and if appropriate for the Unit, a copy of the CONFIDENTIALITY Agreement regarding proprietary or confidential information with a request to return a signed copy. The Unit will be responsible for transportation, lodging, and subsistence costs for the Panel members.

Review Agenda: It is essential that the Review Panel be allotted adequate time to absorb relevant information, dialogue with scientists and support staff, develop consensus on issues,

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arrive at conclusions, make recommendations, and write a draft report. Scheduling sufficient on-site time for these important activities results in improved team performance, reduces the time needed in home offices to draft reports, and lessens the time in which the final report can be written and forwarded to the Area Director. The duration for an on-site review depends on the size, logistics, complexity, and diversity of the Unit(s). Single Unit reviews usually require a total of three days, including time for deliberation and writing a draft report. Multi-Unit reviews may require more time. If so, this should be addressed by the Unit before inviting panel members.

The Review Panel is encouraged to interact as a Unit with the scientists, rather than dividing the Review Panel into sub-units and conducting concurrent sessions. Panel cohesiveness in the process enhances consensus building on issues and recommendations.

1. The review begins with an executive session (60 minutes) with the Review Panel, Area Director(s), National Program Leader(s), and Research Leader or Laboratory Director or Center Director for an overview of the review goals and objectives and to answer any questions the Review Panel may have. (This meeting usually occurs at an evening dinner prior to the review.)
2. In an opening session for all Unit staff, a brief Charge as to the objectives and expected outcomes of the review is given by the AD. In addition, a brief overview of the National Programs supported by the Unit's research is presented by the NPL(s).
3. If the Unit is part of a Laboratory or Center, the LD or CD will present an overview of the Laboratory or Center and a brief description of how the Unit being reviewed fits into the overall scope of the Laboratory or Center programs.
4. The RL will present a brief history, vision, mission, strategic issues, broad objectives, and outcomes for the Unit.
5. A more in-depth presentation of the research program will be reported by program (problem) area, where all scientists may or may not be involved in the presentation. The presentations should be structured around the review criteria: research performance, research quality, research capacity, and national and international research leadership (see Final Panel Report section). Presentations should not emphasize data or methodology; but instead should focus on objectives, hypothesis, progress, accomplishments, impact and possible direction of new research. If the panel has questions, they will ask.
6. The Panel will meet with the scientists as needed for an in-depth discussion of the research. These meetings may be scheduled at the request of the panel, generally outside of the scheduled presentation times, to follow-up on information provided during the Unit's presentations. The inclusion of postdoctoral research associates in the review will be at the discretion of the scientists and RL.

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7. The RL will schedule time for the support staff to meet with the Review Panel. Whenever feasible, the administrative staff and technicians should meet with the Panel in separate groups.
8. An interview with the RL/LD/CD and the NPL(s) will be scheduled as needed.
9. An interview with the Unit's customers / stakeholders will be scheduled.
10. Additional interviews are at the discretion of the Panel.
11. The Unit will provide the Panel with a tour of the facilities and physical resources. A facilities location map will be provided.
12. The Review Panel will meet in Executive Session with the AD(s) and NPL(s) at least once after the first day of the review to answer questions and clarify ARS Mission and objectives and other concerns that may have arisen. The Review Panel will privately draft a report following all scheduled meetings/interviews/presentations. It may take several hours for the team to complete a draft report. Clerical services will be offered the Panel by the Unit, and the RL, LD, CD, AD, and NPL will be available to answer questions during this period.
13. Oral Panel Report. The Panel will give a brief oral report of its preliminary findings in an executive session to the AD, NPL(s) and CD, LD and/or RL, followed by a second oral report to the entire staff.

Briefing Book: The Unit will develop an informational document to orient the Review Panel. An electronic copy of the briefing book should be sent to the Area Office for review before providing copies of the book to the Review Panel, ONP and the Area Office (2 copies) one month prior to the review. Depending on panel preference, both hardcopy and electronic versions of the briefing book may be required. This review document includes a clear description of the Unit's vision, mission and strategic issues (problem areas) being addressed, status of research, personnel, and outcomes. The material should be organized to address the four criteria the Panel will use to evaluate the Unit: research performance, research quality, research capacity, and national and international research leadership. Providing relevant information for advance study by the Review Panel contributes to both the efficiency and effectiveness of the process. It minimizes presentation time during the reviews, permits a concentrated focus on important materials, and ensures that the majority of time is devoted to major issues.

The following is an outline of items to be included in the review document. The material should be organized to facilitate use by the Panel during the review by collating the materials with the items on the agenda by function or subject matter, and by organizing the document to address the four criteria used for evaluation. (See section on Final Panel Report.)

1. Agenda:
 - a. Include beginning and ending times on the agenda
 - b. Give first names of participants, not just initials

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- c. Identify speakers by name and title
2. Brief, 1-2 pages, biographical sketch of Review Panel members
3. Organizational structure including research projects (CRIS) and resources available to the Unit. Show land, facilities, equipment, research subject materials, and animals. List permanent and temporary funds separately and include the amount of grants, trusts, and CRADA.
4. Vision and mission statements and strategic issues (problem areas) being addressed by the Unit
5. For each research program (CRIS project) being reviewed provide a brief statement of the following:
 - a. Funds available and staff assigned. Include for each scientist the support available, e.g. personnel, discretionary funds, travel, shared research support, etc.
 - b. General hypothesis and objectives
 - c. Brief discussion for each program of the research performance (address how the research has met the goals/milestones of the OSQR approved project and its relevance to the national program), research quality, research capacity, and national and international research leadership provided by the scientists
 - ii. Major discoveries or scientific breakthroughs
 - iii. Information or technology developed by the Unit that is being used by customers, stakeholders, etc.
 - i. Systems or computer programs developed
 - ii. Collaboration/partnerships (Universities, Industry, etc.)
 - iii. Status of technology transfer efforts (CRADA's, MOU's, SCA, etc.)
 - iv. Potential future direction
6. Interactions with customers (focus groups, etc.)
7. Appendix:
 - a. List of Unit personnel and titles
 - b. Biographical sketch of each scientist (name, title, education, work experience, significant honors, committees, technology transfer activities, grants and contracts (soft funds), significant research outcomes, and from the past five years the most significant peer-reviewed publications and invited presentations
 - c. List of patents and the following publications of the Unit by year:
 - i. Patents received
 - ii. Articles in refereed professional journals
 - iii. Books
 - iv. Chapters in books
 - v. Research bulletins, proceedings, and other research reports
 - d. National Program Statements / Action Plans

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- e. List of Acronyms
- f. Panel report from previous expert review and the status of the Unit's implementation of the panel's recommendations

Conducting the Review

Proper usage of the limited on-site time of the Review Panel is essential to the process. Time management is most effective and produces the most productive results if scientists' presentations focus on research programs within the Unit, rather than on individual projects or studies. Project-by-project presentations are time consuming and make it difficult for members of the Review Panel to grasp research programs, team research, or the future direction of the Unit's research. The attendance of all scientists is necessary for the Panel to fully comprehend program independencies, future plans and alternatives, learn about activities throughout the Unit, and benefit from an information exchange with the Review Panel. It is important that all scientists working in the programs participate in the review, respond to questions, and be available to offer additional information.

Panel members are expected to study the background material prior to arriving at the location. Therefore, it is not necessary for presenters to repeat detailed information provided in the briefing document. The presentations should be structured to provide concise information that will help the Panel address the four review criteria. Is the Unit's research performance progressing well toward its stated objectives? Is the research of high quality? Is the research capacity adequate? What is the Unit's contribution to national and international research leadership? Presentations should also focus on future research plans, and on relationships among research programs at the location and between other ARS locations, universities, and industry. Presentations should be well organized and utilize visual aids, overheads or PowerPoint, etc. to highlight important material. The presenter should avoid procedural details or methodology, unless a program objective is to explore new methodologies, and encourage Review Panel questions and dialogue. Copies of presentation handouts will be provided to the Panel prior to the presentation.

Adequate time should be allotted for discussion, and scientists should be encouraged to share ideas with the Panel and among themselves. Group interaction and dialogue are enhanced if seating is arranged so individuals face each other, rather than in classroom style. Members of the Research Unit and Review Panel should make every effort to create an atmosphere that encourages exchange of ideas.

Participation in the Review: Every effort should be made to have the entire scientific staff participate in all sessions throughout the review, rather than just when their area specialties are being discussed. Participation of all scientists is necessary to fully grasp program interdependencies, share in discussions of future plans and alternatives, learn about activities throughout the Unit, and benefit from an information exchange with the Review Panel. If at all possible, technical and clerical staff should also be invited to attend the Unit's presentations. If

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feasible, the review should be held away from the Unit offices to reduce work day distractions. However, selection of the review schedule and site should allow scientist and staff to maintain their regular activities during times when the scientists' participation is not required.

Work space should be available for the review team throughout the entire process, particularly during the evening when organizational meetings, writing or discussions may be conducted. Word processing equipment should also be available as should secretarial assistance to work on draft reports, if necessary.

Role of the Panel Chair: Prior to the review the Panel Chair will develop a strategy to optimize the operation and activities of the Panel members, including any special assignments each member may have. The strategy and team member responsibilities should be reviewed in an on-site planning meeting with the Panel members just prior to the commencement of the review. The Panel Chair is responsible for overall coordination of the review team activities, facilitating communication, and identifying the need for additional material. The Panel Chair directs discussions to the issues of the review purpose and objectives, keeps presentations and discussion within the prescribed time schedule, and helps avoid non-productive discussion paths. It is the joint responsibility of the Panel Chair and Unit RL/LD/CD to make productive use of the scientists and Review Panel's on-site time. Members of the Review Panel share the responsibility for the success of the review with scientists and ARS administrators.

Role of the Review Panel: The Panel's main functions are to provide an objective appraisal (strengths and weakness) and suggestions for improvement regarding the four review criteria. It is essential for the Panel to ask pertinent questions and gather information relevant to their analyses. Occasionally, Panel questions may appear critical of the Unit or of the individuals questioned. These questions are purely for information purposes and are not intended to indicate the personal or professional view of the Review Panel. These inquiries are an essential part of the review process and facilitates the Panels objective analysis of the Unit's research programs.

Closing Sessions: Upon completing its deliberations, the Panel will provide an oral report, including assessments and recommendations, in a separate executive session with the ARS AD(s), NPL(s), and RL/LD/CD, and in a general session with the Unit. The closing executive session and Panel report to Unit staff serves several important functions. It provides:

1. An evaluation of the Unit's research performance, research quality, research capacity, and research leadership nationally and internationally.
2. A list of specific Panel recommendations.
3. Other considerations important to strengthening the Unit's programs.

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Final Panel Report

Immediately following the review, the Panel Chair compiles team input and prepares a written report to include an overall evaluation of the Unit programs that includes observations, analyses, conclusions, and recommendations for improvement. The final report is due to the Area Office within six weeks of the review and should specifically address the following review criteria.

Research Performance:

1. How well has the research progressed toward meeting its stated objectives?
2. Is the research producing the anticipated benefits to end users, scientific communities and the broader society?
3. Suggestions for improving the performance of the research to address relevant components of ARS National Programs.

Research Quality:

1. How good is the current research program compared with other research programs in the field?
2. What is the quality of published research?
3. Is the research being performed at the forefront of scientific and technological knowledge?
4. Will this research lead to appropriate advances in the future?
5. Suggestions for improving the quality of the research.

Research Capacity:

1. Are the Unit's facilities, land, laboratories, and equipment adequate?
2. Is the Unit adequately staffed with personnel who have appropriate skills? (include support staff)
3. Is the Unit's funding adequate? (include both hard and soft funds)
4. Are the Unit's collaborative relationships adequate and appropriate?
5. Suggestions for improving research capacity.

Research Leadership:

1. What is the Unit's contribution to national and international leadership in their specific fields?
2. How would you benchmark the Unit's leadership in relation to national and international leadership?
3. Suggestions for improving national and international leadership.

Suggested Panel Report Format:

1. Executive Summary (one to three page overview of key assessments and recommendations)
2. Background
 - a. Reason for the Review
 - b. History/Organization of the Units(s)
 - c. Date(s) and location of the Review, names and affiliations of Panel members

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3. Assessments
 - a. Research Performance
 - b. Research Quality
 - c. Research Capacity
 - d. Research Leadership
4. Recommendations
 - a. Research Performance
 - b. Research Quality
 - c. Research Capacity
 - d. Research Leadership

Implementation of Panel Recommendations

When the final panel report is received, the Area Office will provide a copy to ONP for their comment so that any concerns or guidance can be conveyed to the Unit along with the report. If warranted, a conference call may be scheduled with ONP and the CD/LD/RL(s) to discuss how the Unit will address the concerns raised by the Panel. The Unit will have one month after receiving the Panel report to draft a written implementation plan to the Area Director outlining steps to be taken to implement Panel recommendations. The implementation plan will address each recommendation with milestones and resource implications. Units are encouraged to schedule retreats or other follow-up activities to discuss and plan how they will implement Panel recommendations and to draft the implementation plan. Analyzing and responding to the review report is an important additional benefit of the overall process, especially when the recommendations are incorporated into the research project plan prepared for the OSQR review process. The recommendations contained in the written review report are extremely useful to the Units as they strive for excellence in their research programs.

The final Unit implementation plan will be shared by the AD with ONP for comment and discussion prior to final AD approval. It will then be sent to the Panel members for their information.

Suggested Implementation Plan Format:

1. Summary Remarks from Unit
2. List Panel recommendations by category, number them sequentially and briefly discuss how the Unit plans to address each recommendation.
3. Provide action response for each numbered recommendation (see Implementation Plan Template):
 - a. Specific: identify particular actions that will be taken by Unit personnel
 - b. Measurable: establish criteria for measuring progress (i.e., training conducted, manuscripts published, positions filled)
 - c. Achievable: ensure that the response is manageable within the resources available
 - d. Timely: identify actions that can be taken in the next 12-month period and set target dates for accomplishing each action

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Once the implementation plan has been approved by the AD the Unit will use the Implementation Plan Template found on page 13 to provide a minimum of two status reports, preferably 6 months and 12 months after the plan is approved. All milestones should be designed to be accomplished within 12 months if at all possible.

Implementation Plan Discussion Examples:

Recommendation 1: Additional training on policies and procedures should occur for all support staff.

Implementation Plan: Training will be provided by the Research Leader to all employees once uniform policies are developed.

Milestone: Training will occur beginning with implementation of uniform policies in October 2005. Training will be provided afterwards on an as-needed basis. All new employees will be trained on policies as part of their orientation.

Recommendation 2: Turn data into usable information through cost-benefit analyses and decision support modules.

Implementation Plan: We will identify types of cost-benefit analyses that growers want for precision agriculture and the data available to do these analyses. We will identify and evaluate existing models that may be useful for generating cost-benefit analyses for irrigation, N- and weed-management in precision agriculture and begin modifying our Unit's weed management model, WeedSite, to become a tool for prescribing spatially variable application of inputs besides postemergence herbicides. We will also modify WeedSite to generate spatially variable application maps for use with the Unit's spatially variable sprayer.

Milestones: Obtain input from growers and other customers on what they consider useful information by the end of 2005. Identify and prioritize models and begin discussions with potential collaborators by March 2006. Modify WeedSite for soil-applied chemicals by December 2005.

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Definition of Terms, Abbreviations, and Acronyms

AD: Area Director.

AFM: Administrative and Financial Management. This branch of ARS manages support activities, such as procurement, facilities, fiscal allocations, and personnel operations at all levels in ARS.

ARS: Agricultural Research Service, an agency in the Research, Education, and Economics Mission Area of USDA. ARS has about 8,000 employees, including 2,000 senior scientists. The Agency conducts research at over 100 locations in the U.S. The Agency is led by an Administrator and is divided geographically into eight Areas, which are led by Area Directors.

CD: Center Director. See Laboratories or Centers.

CRIS Projects: CRIS stands for "Current Research Information System." This is an electronic system for the filing and retrieval of information about individual agricultural research projects. In ARS, the terms "CRIS Work Unit" or the acronym "CRIS" are used synonymously with "research project" or "project." New projects are planned in coordination with ONP and are subject to external peer-review. This review is coordinated by the Office of Scientific Quality Review (OSQR), located in Beltsville, MD. The normal life of a project is five years.

Laboratories or Centers: Locations with more than one Research Unit may be called a Laboratory or Center. These are administered by a **Laboratory or Center Director**.

LD: Laboratory Director. See Laboratories or Centers.

NPA: The Northern Plains Area, comprised of four Research Centers, two Research Laboratories, and 40 Research Units, at 14 locations in the eight states - Colorado, Wyoming, Utah, Montana, North and South Dakota, Nebraska, and Kansas. The annual budget for the Area is over \$100 million, with 1000 federal employees, of which 279 are senior research scientists (SYs). The Areas are responsible for implementation of research programs and the scientific merit of the research and is administered by an Area Director (AD).

NPL: National Program Leader, a member of the Office of National Programs.

ONP: Office of National Programs. Members are called National Program Leaders and each is a subject matter specialist. ONP serves the Administrator of ARS in developing and coordinating research plans and strategies on a national basis. ONP sets National program directions (relevance), establishes priorities, allocates resources, and acts as a clearing-house for decision-making. Considerable interaction between Area managers and ONP is required to fulfill respective roles.

NPT: National Program Team. A cross-cutting team composed of National Program Leaders.

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OSQR: Office of Scientific Quality Review. As a result of Public Law 105-185, the Agency established the Office of Scientific Quality Review to coordinate the peer review of all research (CRIS) project proposals in ARS, by a panel of individuals on a five-year cycle.

Other Scientific Personnel: Research scientists are responsible for all phases of research. ARS also employs research associates (post-docs), support scientists (who have responsibility for some portion of a project), technicians, students, and, in some operations, non-research scientific personnel who perform work involving service to the public or to other government agencies.

PDRAM: A Program Direction Resource Allocation Memo outlines objectives for each ARS research project, identifies linkages to the National Program Action Plan and defines the funding and SY time available to accomplish its objectives. PDRAMS are produced by the NPL near the beginning of an OSAR cycle to guide drafting of the Unit's project plans.

RL: Research Leader. See Research Units.

Research Units: Research Units are the basic management entity within ARS. It is in the Research Units where our business of research is conducted. There is at least one and usually several research projects (CRIS Projects) in each Unit. Research Units are led, both scientifically and administratively, by **Research Leaders**. Typically, a Research Unit is comprised of 5-10 research scientists, a scientific and clerical support staff, technicians, post-doctoral employees, and temporary students.

SY: Scientist Year. This is the effort of a research scientist for one year. Fractional efforts (e.g., 0.5 SY) may be assigned in a given project. It is possible for a scientist to work on more than one project during the course of a fiscal year. The term is also used in ARS as a synonym for a research scientist (e.g., six SYs (research scientists) in the Unit).

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_____ **Research Unit Implementation Plan**
 As of _____

Recommendation	Action Planned	Action assigned to	Target Completion Date	Actual Completion Date	Action/Accomplishment Update
Research Performance					
1.					
2.					
3.					
Research Quality					
4.					
Research Capacity					
5.					
6.					
7.					
Research Leadership					
8.					
9.					
10.					