SUMMARY TABLE OF MATRIX MANAGEMENT

ACTION	*LEAD*	*CONFER WITH*	*APPROVED BY*	*Section #*
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· National Program/Components	NPS	AD	DA	3.1.1
· National Program Action Plan	NPS	AD	DA	3.1.1
· Regional Programs	NPS	AD	Concurrence*	3.1.1
· Center/Institute	CD/ID/AD	NPS	Concurrence	3.1.2
· Laboratory	LD/CD/ID/AD	NPS	Concurrence	3.1.2
· Research Unit	RL/CD/ID/AD	NPS	Concurrence	3.1.2
· Research Project	**LS/RL/CD/ID/AD**	NPS	Concurrence	3.1.2
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Develop National Programs	NPS	AD	DA	3.1.3
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Develop Strategic Plan for:				
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· Regional Activities	NPS	AD	Concurrence	3.1.3
· Center/Institute	CD/ID/AD	NPS	Concurrence	3.1.2
· Laboratory	CD/ID/AD	NPS	Concurrence	3.1.2
· Research Unit	RL/CD/ID/AD	NPS	Concurrence	3.1.2
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OSQR Peer Review Process:				
· Management of OSQR peer review	OSQR	NPS/AD	OSQR	4.1.1
· Development of research prospectus	**LS/RL/CD/ID/AD**	NPS/OSQR	Concurrence	4.1.1.1
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ACTION	*LEAD*	*CONFER WITH*	*APPROVED BY*	*Section #*
Programs	AD			
International Collaborations	LS/RL/CD/ID/ AD	OIRP/NPS	Concurrence	4.2.4
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· RPES	RL/CD/ID/AD	NPS	AD	5.1.2
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GPRA Plan and Report	NPS	AD	DA	5.2.1
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*If agreement cannot be reached through concurrence, the Office of the Administrator should be involved.

Definitions:

AD = Area Director
BPMS = Budget and Program Management Staff
CD = Center Director
CIO = Chief Information Officer
CR = Civil Rights Office
DA = Deputy Administrator, NPS
ID = Institute Director
LD = Laboratory Director
LS = Lead Scientist
NAL = National Agricultural Library
NPS = National Program Staff
OA = Office of the Administrator
OSQR = Office of Scientific Quality Review
OIRP = Office of International Research Programs
OTT = Office of Technology Transfer
RL = Research Leader

Matrix Management of ARS Research

1 INTRODUCTION

The Agricultural Research Service (ARS) is the principal in-house research agency of the U.S. Department of Agriculture (USDA). ARS is one of four agencies in the Research, Education, and Economics (REE) mission area. ARS is charged with extending the Nation's scientific knowledge with programs in agriculture, human nutrition, food safety, natural resources, the environment, library and information services, and other topics affecting the American people on a daily basis. ARS supports more than 2,000 permanent scientists working on approximately 1,050 permanent research projects at more than 100 locations across the country and five foreign laboratories and more than 150 librarians, technical information specialists and other library specialists who work at the two locations of the National Agricultural Library, the Abraham Lincoln Building in Beltsville, Maryland, and the Library's Reference Center in Washington, D.C. The role of ARS is reflected in the Agency's mission statement:

> *ARS conducts research to develop and transfer solutions to agricultural problems of high national priority and provide information access and dissemination to:*
> - *ensure high quality, safe food and other agricultural products,*
> - *assess the nutritional needs of Americans,*
> - *sustain a competitive agricultural economy,*
> - *enhance the natural resource base and the environment, and*
> - *provide economic opportunities to rural citizens, communities, and society as a whole.*

ARS research and library and information services complement the work of State Colleges and Universities, State Agricultural Experiment Stations, other Federal and State agencies, and the private sector. Mechanisms for addressing State and local issues are already in place; therefore, activities within ARS focus on issues having a regional or national scope and where there is a clear Federal role. ARS also provides research and library and information services support to USDA action and regulatory agencies and to several other Federal regulatory agencies, including the Food and Drug Administration and the Environmental Protection Agency.

Two important meetings for conducting ARS business are the Operations Staff meeting and the Administrator's Council (see Appendix 1 for more detail on these meetings). These two meetings provide a forum for making key decisions under the direction of the Administrator and Associate Administrator. Together they form the Office of the Administrator (OA). The OA oversees the program formulation, direction, management, and administration in the Agency. OA liaisons with Departmental officials and works closely with other Agency leaders. The Administrator also serves as a spokesperson for the Agency including meeting and working with ARS customers, stakeholders, and partners.

The purpose of this document is to provide guidance for managing ARS' research programs. It is intended for use within the Agency.

2 THE ARS NATIONAL PROGRAMS

In 1996, ARS began revising the way it manages research by instituting a National Program structure. A National Program is a set of research projects directed from across the Agency toward common goals to solve agricultural problems of high national priority. The National Programs encompass the research needed to respond to a wide range of problems and opportunities facing U.S. agriculture. Research projects are assigned to no more than two National Programs, with 60% or more of the project to one of the two National Programs. Leadership of each National Program is provided by a team of National Program Leaders from the National Program staff (NPS). Managing research projects in each National Program involves cooperation among NPS and other Headquarters offices, Area Offices, and Institutes, Centers, and Laboratories and Management Units. Management of ARS research is accomplished by using matrix management.

2. 1 Matrix Management – Overview

Matrix management is a multi-dimensional management system that attempts to complete large projects, such as National Programs, by organizing teams along functional areas rather than project or specific task boundaries. Specific advantages to defining boundaries based on function include:

- Information is more easily shared across functional boundaries, and
- Depth of knowledge is increased because of enhanced specialization.

A "matrixed" organization, then, is one in which people concentrate on specific areas of the organization. As a result, each person in the organization may need to interface with several managers. A disadvantage is that conflicts of interest and priority may lead to confusion and miscommunication. A properly managed environment helps alleviate this problem. Matrix management may also add additional difficulty on direct project managers because of the number of other managers and workers that need to be involved. Finally, all functional managers need to communicate and come to consensus with project managers on the goals, objectives, and priorities.

2.2 Matrix Management—ARS Approach

ARS employs matrix management to provide both programmatic guidance and line management for its widely dispersed locations. The objective is to have the Headquarters-based NPS take the lead in providing the programmatic vision and research direction to ARS scientists working in each National Program. Responsibility for implementing the research projects in each National Program, day-to-day management of each research unit, and ensuring that quality research is conducted within the parameters established by the National Programs, falls to the Area Directors and the line management structure they oversee. Although NPS and line management have a lead responsibility for different phases of the implementation process, only when all parties work in close consultation with each other does matrix management achieve its true value. Matrix management in ARS relies on a high level of collegial give and take among the more than 50 individuals (8 Area Directors, 8 Associate Area Directors, 3 Assistant Area Directors, 1 National Agricultural Library (NAL) Director, 1 NAL Deputy Director, 1 Deputy Administrator, NPS, 3 Associate Deputy Administrators, NPS, and 30+ National Program Leaders); this does not include the many Research Leaders and Lead Scientists directing the actual research projects. In addition, staffs from other Headquarters offices such as the Office of Technology Transfer (OTT), Office of International Research Programs (OIRP), and Office of Scientific Quality Review (OSQR) need to be engaged at appropriate times. To succeed, this approach must take into consideration differing roles (that are not always well defined), disciplines, responsibilities, and personalities. Matrix management only works in ARS if there is:

- an understanding of vastly differing roles during ongoing communication,
- mutual respect among all participants and a commitment to a team approach to problem solving,
- continual engagement and resolution of key issues in a mutually satisfactory manner,
- an intuitive instinct of when to involve the Associate Deputy Administrator(s), NPS; Deputy Administrator, NPS; Associate Administrator; and/or Administrator in negotiations, and
- patience and a high level of commitment to the process by all parties.

ARS has established a methodology for developing, implementing, and evaluating National Programs and the research projects within them. The cycle includes first the determination of program relevance. Relevance is determined through a variety of workshops and is defined through a planning process. The second step in the program cycle is ensuring quality. This is accomplished by working through line management to develop research plans that meet the program objectives and to implement these projects. Finally, the impact of the program must be assessed. Several evaluation metrics are used to assess the success of the programs and the projects within the programs. These issues are now discussed in detail.

3 DETERMINING PROGRAM RELEVANCE

The National Programs include the full range of research activities needed for ARS to achieve the objectives in the Strategic Plan and the vision, mission, and objectives identified for each National Program. The goal of the program development process is to identify and meet the needs of clients, stakeholders, and partners in the areas of food, health, environment, and community well-being by directing the Agency's research assets and skills to generate new knowledge and technologies. These goals are ever-evolving in response to current needs.

The ARS Strategic Plan and the detailed Action Plans of the National Programs are the key documents in shaping the overall ARS research program. These documents rely on a balanced portfolio of fundamental, applied, and developmental research to solve technical problems confronting agriculture and related industries. Development and maintenance of the ARS Strategic Plan, the National Programs, and the National Program Action Plans are the responsibility of NPS with input from line management. NPS is responsible for providing the broad programmatic vision, planning, and coordination for the ARS National Programs and articulating the goals and objectives of the National Programs to the Agency's customers, stakeholders, partners, and the general public.

3.1 Program Development

3.1.1 Establishing Priorities

The Administrator ensures research and library and information services are consistent with the goals of the Administration and the Department. Using information generated at all levels of the Agency, NPS establishes and articulates ARS priorities, allocates resources, recommends program redirections and, with input from the Area Directors, NAL, and BPMS, develops the Agency's annual budget requests. NPS, in consultation with Area Directors and NAL, updates the ARS Strategic Plan, reviews the National Program structure, and revises the National Programs and the National Program Action Plans.

3.1.2 Developing ARS Strategic Plans

The ARS Strategic Plan is developed by NPS. Insight into elements necessary for inclusion in this document are obtained from customer and stakeholder workshops, National Program technical meetings with key scientific leadership, and current direction within the Agency. Area, NAL, Center, Institute, and Location levels must also develop strategic plans to effectively capture and focus the Agency's resources to ensure the highest quality research program.

3.1.3 Establishing National Programs

The Administrator relies on the Deputy Administrator, NPS, to oversee the development and evaluation of the National Programs. NPS works and coordinates with the Area Directors to provide direction to the ARS research program, establish priorities in the ARS Strategic Plan and the National Program Action Plans, and develop the Agency's annual budget proposals. Also in collaboration with the Area Directors, NPS identifies research opportunities and research needs that are expressed by customers, stakeholders, partners, and advisory groups. The National Programs are designed to be dynamic statements of research needs and they are adjusted to meet changes in Agency direction. Each National Program must define the potential benefits, outcomes, and impacts of achieving the stated goals and objectives, show a high probability of success, and fulfill targeted needs of the agricultural community in a cost-efficient manner.

3.1.4 Customer and Stakeholder Workshops

The program development process begins with the convening of at least one National Program Workshop for each National Program per 5-year cycle. The National Program Workshops provide a structured format for receiving input from customers, stakeholders, and partners. They are designed to define specific researchable problems aimed at meeting high priority needs within the agricultural community. The Workshops also provide an opportunity for ARS research scientists and program managers to interact and develop rapport with customers, stakeholders, partners, non-ARS scientists, and representatives from other agencies. In addition, research collaborations among Agency scientists are developed during the National Program Workshops. The National Program Leaders overseeing a particular National Program are responsible for organizing, conducting, and summarizing National Program workshops. Area Directors, Center Directors, Institute Directors, Laboratory Directors, and Research Leaders having projects within a given National Program are responsible for providing lists of people appropriate for invitation to each workshop.

3.2 President's Budget Development

The annual development of the Agency's budget proposals provides ARS an opportunity to detail the priorities and research needs of American agriculture in a complete, comprehensive, and coherent manner. The NPS Budget Team, an ad hoc group appointed by the Deputy Administrator, NPS, whose membership changes yearly, incorporates input from NPS and the Area Directors to construct the ARS portion of the proposed Presidential budget. While NPS is primarily responsible for developing the ARS budget, Area Directors play an important role in the identification of high-priority research needs because of their interaction with State, local, and regional governments, organizations representing producers and processors at the area level, farm media, and congressional offices in each state. Research Leaders should use this opportunity to communicate Management Unit needs through supervisory channels to the Area Director and to the appropriate National Program Leader.

3.2.1 Time Table for the Development of the President's Budget Request

The Administration's budget for the next fiscal year is announced by the President in February. This is typically followed by budget hearings before the budget is approved by Congress and signed by the President. However, before the budget is announced by the President, much work is done by the Agency in preparing the budget request. The budget team appointed in April of the previous year oversees the development of the budget to be announced by the President. Specific details regarding the budget development process are given in Appendix 2.

3.2.2 Off Budget Financial Issues

- ***Moving Resources between Locations***. To move resources between locations, Area Directors should consult with NPS and have preliminary conversations with the Administrator's office before submitting the proposal for Operations Staff consideration. Moving money across congressional districts requires congressional approval.

- ***Decreasing Budget and Redirecting Resources***. NPS and Area Directors need to give a common message to all the customers and stakeholders interested in a specific project or location. ARS must provide up-to-date, accurate information to the people and groups who have historically supported ARS research programs. A realistic assessment of what research issues can and will be addressed must be provided. Reallocation of funds across CRIS projects within a Management Unit as proposed by a fundholder (Research Leader) must be approved by the Area Director and the appropriate National Program Leader.

- ***Over-extended Projects***. Research scientists may sometimes face a situation where they are asked to do more research than available resources allow. In such cases, the Area Directors should work with the appropriate National Program Leader and the Research Leader to narrow the program scope, if appropriate, to suit available resources. If the questioned research is determined to be of lesser priority than an emerging priority, then redirection of resources may be the appropriate solution.

- ***Fluctuations in Support, Available Resources, and Under-funded Projects***. Over time, projects and programs experience fluctuations in level of support. Area Directors should work with Research Leaders and appropriate National Program Leaders in an attempt to mitigate resulting problems by Developing options and strategies for securing additional funds to supplement appropriated resources.

- ***External Requests for Agency Commodity/Program Funding Levels***. These requested financial statements must be obtained from the Budget and Program Management Staff and are based on "gross frozen dollars." This avoids giving out conflicting and confusing summaries of ARS investments in various programs.

3.3 Implementation Memoranda for Program Increases

When the appropriation process is completed, the Agency establishes the funding levels for all new program increases. The lead National Program Leader for the project consults with the Area Director, other members of the National Program Team, and the Research Leader of the fund-receiving Management Unit to obtain background information necessary to prepare the Implementation Memorandum, to identify the new or expanded funds, to determine the ARS project targeted to receive the funds, to provide guidance to the Research Leader concerning the preparation and submittal of revised AD-416/417s to reflect changes in the project, and, when significant changes are made in the project, to provide guidance on the project's need for peer review. Likewise, if a new project is to be created, the Implementation Memorandum will reflect the appropriate guidance.

When preparing the Implementation Memorandum, adequate funding per Research Scientist should be taken into consideration. When adequate funds exist, Research Scientist recruitment information is included, as appropriate. The National Program Leader works closely with the Area Director and Research Leader to provide specific guidance for implementing extramural agreements when congressional language calls for cooperative research with universities or other organizations. The general policy in these cases is for ARS to develop cooperative research by using some of the funds to support in-house research and part to support cooperative extramural research on the same issue. In these situations, the intramural and extramural research should be closely coordinated to ensure cost effectiveness and maximum benefit to American agriculture. Unless otherwise specified, the transfer of these funds to cooperating institutions should occur within 90 days of the funds being made available to ARS. All such memoranda must be approved by the respective Associate Deputy Administrator, NPS; Deputy Administrator, NPS; and the Administrator.

3.4 Program Planning

3.4.1 National Program Action Plans

Information received during the National Program Workshop is used by the National Program Team to develop a detailed Action Plan for each National Program. This document identifies the high-priority researchable issues identified during the program workshop and delineates mechanisms for addressing these issues. Each Action Plan provides information on the rationale for the National Program and identifies the vision, mission, goals, components, objectives, and anticipated outcomes and impacts of the proposed research. Sufficient detail must be presented in the Action Plan to provide guidance to each ARS scientist working in the National Program for

developing specific project plans to address the needs of American agriculture and related industries. NPS and Area Directors work together to ensure coordination of efforts for specific problems within and across Areas. The Action Plans are subject to modification as needed.

3.4.2 Creating, Modifying, or Terminating National Programs

The National Programs grow and evolve as needs and priorities change. The National Programs operate on a 5-year cycle and each program undergoes a thorough assessment near the end of the program cycle. At that time, National Program Leaders, in consultation with the Area Directors, customers, stakeholders, and partners examine the benefits of changing an existing program, creating a new program or program components, or terminating a program. Such alteration of the National Program structure must be approved by the Deputy Administrator, NPS.

3.4.3 Selecting new Research Leaders and Research Scientists

Major scientific personnel decisions require continued interaction between line management and NPS. In filling vacant Research Leader positions, Area Directors and line management are responsible for posting and selecting the candidate for approval by the Administrator. In filling a Research Scientist vacancy, the Research Leader of the selecting unit develops a position description and recruits candidates per ARS policy. As with Research Leaders, NPS should have input in developing the position description (PD) and approving the PD prior to advertisement. The selecting official subsequently evaluates and recommends a candidate to the Area Director. The Area Director confers with NPS before selection of the research scientist is approved by the Area Director.

4 Ensuring Program Quality

4.1 Project Design and Development

4.1.1 Preparing for OSQR Peer Reviews

The Office of Scientific Quality Review (OSQR) was established in 1999 in accordance with the Agricultural Research, Extension, and Education Reform Act of 1998. OSQR is charged with developing and maintaining the infrastructure of an external panel-based peer review system for all proposed ARS projects. All projects within a National Program are reviewed on 5-year cycle. The system ensures that projects are developed, peer-reviewed, and implemented across a diversity of locations in a collaborative and synchronized manner. The system also allows the teams of experts to evaluate research project plans of an entire National Program simultaneously. OSQR selects Panel Chairs, approves panel nominees selected by the Panel Chair, hosts panel meetings, conducts post-panel debriefings, and provides panel evaluations and recommendations of project plans to NPS and Area Directors. As soon as all issues have been resolved, the projects are approved and implementation moves forward.

4.1.1.1 Developing the Prospectus

In accordance with the OSQR schedule, the National Program Team provides guidance in the development of research prospectuses that address the high-priority goals identified in the National Program Action Plans. Research Leaders/Lead Scientists develop a Prospectus that outlines the direction, objectives, and approaches for the research to be conducted during the next 5-year program cycle and submits it to NPS with the approval of Center/Institute Directors and Area Directors. In all cases, National Program Teams will emphasize alignment of the Prospectus with the National Program Action Plan and identification of potential collaborative partnerships. The National Program Team reviews the completed Prospectus regarding the alignment of the

document with the agreement reached between the National Program Team and the scientists assigned to develop the research project.

4.1.1.2 Developing the Project Plan

Lead Scientists/Research Leaders, Center/Institute Directors, and Area Directors assume responsibility for overseeing the development of high quality Project Plans. The Project Plans must be developed consistent with the scientific direction contained in the approved Prospectus and with sufficient rigor to withstand the peer review process. Line management is responsible for producing Project Plans that are well written, of high quality, and ready for OSQR review. National Program Leaders are responsible for ensuring that the Project Plans meet the agreed upon objectives described in the prospectuses. Following OSQR review, Area Directors and NPS resolve with the Lead Scientist/Research Leader any major issues identified by the panels.

4.1.2 Establishing, Redirecting, and Terminating Research Projects

A number of factors can drive a decision to divide an existing research project or to create a new project. New funds or the need to redirect work into new areas may argue for terminating, redirecting, or creating a new project to ensure the research moves in the desired direction. Changing customer needs, the results of an expert review of the research unit, or specific problems within a project may necessitate realignment, redirection, or termination. More clearly aligning research to the National Program structure may also justify the creation of new projects. The OSQR process may also be a prime motivator of project realignment. When such a change is needed, the Area Director and National Program Leaders will work closely to ensure such structural changes are made to benefit and support the programmatic goals of the National Program.

4.1.3 Reorganizing a Laboratory

The Area Director is responsible for the overall management of each location/research project. Any reorganization of a laboratory may significantly influence the research being conducted at the location; therefore, the Area Director should develop an agreed upon solution, with National Program Leader concurrence, before submitting for Operations Staff decision.

4.1.4 Reorganizing the National Agricultural Library

The NAL Director is responsible for the overall management of the Library. Any reorganization of a branch or division may significantly influence the Library's service delivery; therefore, the NAL Director should develop an agreed upon solution, with NPS concurrence, before submitting for Operations Staff decision.

4.2 Project Implementation

4.2.1 Implementing Reviewed Research Projects

The Area Director reviews and recommends modifications, as needed, and approves the AD-416 and AD-417 for subsequent NPS approval. The Research Leader appropriately develops or updates the AD-416 and AD-417 associated with the project. The Research Leader will also initiate the research per the milestones presented in the Project Plan. Line management, including Lead Scientist, Research Leader, Laboratory Director/Center Director, Institute Director, and Area Director as appropriate, will oversee the quality of the research being conducted. The Research Leader is responsible for all issues involving personnel and resource management, safety and health, property management, real property, and vehicles. Technology transfer, patents, and copyrights are coordinated between the Management Unit, Area Office, Office of Technology Transfer, and NPS. Research output and impact will be documented in a manner consistent with Agency requirement. Research Leader/Laboratory Director/Center Director may also form Customer Focus Groups to gather in-depth

information concerning the timeliness and relevance of ARS research while offering stakeholders a forum for direct participation in defining future research needs and technology transfer.

The Research Programs Safety Office of NPS plays an essential role in project implementation through oversight and education involving use and disposition of recombinant DNA, animal care and use standards and procedures, human subjects use in research, and radionuclide use, storage, and disposition. The Research Programs Safety Office interfaces closely with National Program Leaders and Area Offices, provides guidance and policy development, and promotes safe and effective practices.

4.2.2 Protection of Intellectual Property Rights

By Federal law, technology transfer, consistent with mission mandates, is a responsibility of each scientist and engineering professional. ARS scientists, following the centralized policy and procedures of the Office of Technology Transfer, are also charged with protecting intellectual property, developing strategic partnerships with outside institutions, and performing other appropriate functions to enhance the effective transfer of ARS technologies to users. The most important methods available for protecting intellectual property include reporting inventions, patents, Plant Variety Protection Certificates (PVPC), licensing, Cooperative Research and Development Agreements (CRADAs), Confidential Agreements, and Material Transfer Agreements. The document P&P 141.2 – ARS (www.afm.ars.usda.gov/ppweb/141-2.htm) provides a full description of the policies and procedures regarding technology transfer in ARS.

4.2.3 Cooperative Research

Cooperative research between ARS and other Federal, State, and industry scientists is strongly encouraged as an efficient means to enhance the productivity, effectiveness, and impact of ARS' National Programs. Such interactions should build upon the strengths of ARS and its cooperators (strength on strength). NPS, in consultation with Area Directors and the Office of Technology Transfer, takes the lead in developing working relationships with national industrial partners and national commodity groups. International research collaborations are similarly important for extending the capacity of ARS to solve high-priority agricultural problems having worldwide scope. Research collaborations are developed at the Management Unit level and approved by the Area Director.

4.2.4 International Activities

ARS conducts research and participates in technology exchange in and with foreign countries to complement and strengthen its domestic research programs. The Administrator has overall responsibility for ARS international activities. The mission of the Office of International Research Programs (OIRP) is to enhance the productivity, effectiveness, and impact of the ARS National Programs through mutually beneficial international research and developmental activities in the fields within the ARS mission. OIRP takes the lead in consultation with National Program Leaders and Area Directors to develop mutually beneficial international programs. The Director of OIRP, in consultation with National Program Leaders, is responsible for management of ARS human and financial resources devoted to overseas research activities. OIRP also, in consultation with NPS, is responsible for planning, allocating resources, and evaluating international research activities that are an extension of and support to the domestic National Programs. OIRP monitors international research activities and keeps National program Leaders and line management informed of pertinent developments.

4.2.4.1 International ARS Laboratories

OIRP and NPS jointly provide leadership, support, management, and guidance for in-house research programs and activities at ARS laboratories in foreign locations. The work of these laboratories is principally focused on biological control and it represents our first line of defense against invasive agricultural pests. OIRP and National Program Leaders jointly define program goals for each foreign laboratory.

4.2.4.2 Other International Activities

NPS and key line management personnel serve in the role of scientific advisor/technical support, policy developers, and analysts to USDA offices/agencies or other Federal departments and agencies for issues involving international negotiations, trade disputes, lawsuits, treaty negotiations/implementation, and with assembling and disseminating reports summarizing national status or positions on key international agricultural issues. NPS collects, collates, interprets, and disseminates information drawn from many international sources. NPS also handles delicate, confidential, and/or classified/sensitive issues, information, negotiations, and/or communications. The Deputy Administrator, NPS; Associate Deputy Administrators, NPS; and National Program Leaders serve on various teams and committees to provide highly technical support as "scientific advisors" or policy developers/analysts.

4.2.5 Developing User-Software

ARS develops software as part of its mission to conduct relevant scientific research aimed at providing solutions to agricultural problems of high national priority. Software is often an appropriate means of delivering scientific knowledge to customers in an integrated form and therefore may be the visible and tangible result of reaching an important milestone in a research program. The ARS User-Software Policy (currently under development) provides guidance regarding the life-cycle analysis of user software. The issues motivating the creation of the User-Software Policy are customer satisfaction and the cost to ARS of developing, supporting, and maintaining software. Some aspects of software development do not meet the definition of scientific research. ARS desires to achieve an appropriate balance between research and development activities and the best possible response to meeting the needs of its customers. The Lead Scientist/Research Leader of an OSQR-approved Project Plan calling for the development of user-software is responsible for heeding the ARS User-Software Policy. The approved Project Plan must include details describing the value of and timeframe for developing a user software product, developing the actual software, documenting the software, and ultimately testing the software (verification and validation), training people to use the software, and delivering the software to the end-users. The Area Director and line management are responsible for guaranteeing the quality and timeliness of the software product in accord with the timetables of the approved Project Plan.

5 EVALUATING PROGRAM IMPACT

5.1 Preparation of Various Projects and Program Reviews, Assessments, and Evaluations

National Program implementation requires close coordination between staff offices (NPS and OSQR) and line managers (Area Directors, Center/Institute/Laboratory Directors, and Research Leaders). The Area Directors and National Program Leaders collaborate as a team to ensure scientific integrity, high ethical conduct, relevance, and scientific excellence in matters of National Program implementation and management, scientific staffing, utilization of resources, field reorganizations, and other matters that may affect the National Programs.

5.1.1 Annual Employee Performance Appraisals

Annual employee performance reviews of scientists are conducted by the Research Leader and reviewed by Center/Institute/Laboratory Director and Area Director as appropriate to ensure high quality and productivity of the research conducted by each scientist in each project and to ensure high quality, timely, and useful products are provided to American agriculture. Research Leader performance reviews are conducted by Center/Institute/Laboratory Director or Area Director as appropriate. The annual employee performance review is also be used to ensure that ARS research is directed at obtaining the goals of appropriate National Program(s).

5.1.2 Research Position Evaluation System

The Research Position Evaluation System (RPES) provides for review of ARS Category 1 positions on a cyclical basis to assure classification accuracy. Under this system, research scientists have open-ended promotion potential based on their personal research and leadership accomplishments, which can change the complexity and responsibility of their positions. Primary management responsibility for RPES rests with the Associate Administrator. RPES is administered on a nationwide basis by the Research Position Evaluation Staff in the ARS Human Resources Division.

5.1.3 Review of Research Units

ARS performs on-site research reviews to improve the current and long-range performance of a location or management unit to meet the changing needs of the ARS mission. Area Directors and Center/Institute Directors with active support and input from National Program Leaders and Location or Management Unit management organize and implement expert reviews of unit research programs. NPS participation in these reviews is determined by the nature and extent of the programmatic issues involved. For many reasons, a rigid timeframe for conducting reviews may be impractical. The review system is flexible and conducted such that "need" is a primary factor determining frequency with the maximum time between reviews being no more than 8 years. The reasons should be clearly stated for calling a review. Where practical, consideration should be given to scheduling local reviews about 9 to 12 months before an OSQR review. This timing allows the review results to feed into the National Program Team guidance on Prospectus development. Additionally, reviews can be requested by the Location, Management Unit, Area Office, or NPS when research unit leadership changes, when a substantial number of new scientists are brought into a project area or research unit, when the research program direction changes, when the OSQR process indicates problems may exist with planned research, or when stakeholders/customers indicate needs are not being met.

Expert Panel Reviews of a Management Unit are conducted to provide an assessment of the Unit's research programs in regard to: 1) relevance to Agency mission (National Program Action Plan), 2) scientific merit, 3) Unit's capacity to perform its mission, and 4) benchmark the Unit's leadership nationally and internationally. The review panel prepares a written report to include an evaluation of the Unit's programs and include observations, analyses, conclusions, and recommendations for improvements specifically addressing 1) scientific and technological impact, 2) research quality, 3) research capacity, and 4) the Unit's contribution to national and international leadership in the relevant fields. The report is submitted to the Area Office, NPS, and the Management Unit. The Unit prepares an action plan to address the panel recommendations. The Area Director, in consultation with NPS, responds to the recommendations of the review panel.

5.2 Additional Evaluation and Assessment Tools

ARS employs other mechanisms that enable it to evaluate program objectives and outcomes, keep programs responsive to the highest priorities, gather information to satisfy various reporting requirements, ensure the quality of science conducted, and support the ARS mission. These tools include Research Project Reports, Mid-Term National Program Assessment, and National Program Assessment.

5.2.1 Research Project Reports (AD-421)

Research project reports are completed on an annual basis for each research project by the Lead Scientist. The Lead Scientist is responsible for following Agency policy regarding the development of

the annual report. Information is included to assist National Program Leaders in developing all reports and information requests required of them. The annual progress report includes significant accomplishments, aggregate accomplishments for mid-term review, anticipated accomplishments for future years, and major technology transfers. Information contained in the AD-421 facilitates reporting accomplishments against the ARS Strategic Plan as required by the Government Performance and Results Act (GPRA), supports ARS' annual budget request to Congress, and provides the information for the National Program Annual Report. NPS is responsible for submitting the ARS GPRA Plan and the Annual Report.

5.2.2 Mid-Term National Program Assessment

A formal assessment will be undertaken during the third year of the National Program cycle. The National Program Team, and such additional expertise as may be required reviews the National Program's progress against the needs identified by the customers and stakeholders at the preceding National Program Workshop and the specific objectives contained in the National Program Action Plan. This assessment looks at the National Program as a whole, not at each individual project. The results of the assessment are presented to the customers and stakeholders at the next National Program Workshop.

5.2.3 National Program Assessment

National Program Workshops allow ARS to periodically update the vision and rationale of each National Program and assess the relevancy, effectiveness, and responsiveness of ARS research. Each National Program is reviewed every 5 years by conducting one or more workshops. National program Teams organize a National Program Workshop to facilitate the review and simultaneously provide an opportunity for customers, stakeholders, and partners to assess the progress made through the National Program and provide input for future modifications to the National Program or the National Program's research agenda.

APPENDIX I: OPERATIONS STAFF AND ADMINISTRATOR'S COUNCIL

Operations Staff

Operations Staff (Op Staff) is led by the Administrator. Op Staff participants, in addition to the Administrator, are Associate Administrators, Deputy Administrator, NPS; the Associate Deputy Administrators, NPS; Deputy Administrator of Administrative and Financial Management; Chief Information Officer; Special Assistant to the Administrator; Director of Budget and Program Management Staff (BPMS); Director of Information Staff; Director of Civil Rights; Legislative Affairs Analyst; Assistant Administrator for Office of Technology Transfer and Director of Homeland Security; Director of the Office of International Research Programs; and Scientific Quality Officer from Office of Scientific Quality Review. The ARS Homepage (www.ars.usda.gov) provides links to these Offices and Programs (www.ars.usda.gov/offices.html) within ARS.

Currently held on Tuesday mornings, Op Staff is the forum where the Administrator is advised of issues of importance to the Agency and where many key decisions are made. The following actions require formal decisions memos in advance of the Op Staff meeting:

- Scientist redirected transfers from one location/duty station to another,
- Naming or renaming of a research unit,
- Organizational changes that involve changes in mode codes, and
- Emergency funding requests, and
- Other decisions of similar importance.

Items to be considered by Op Staff should be sent to the Program Analyst, Office of the Deputy Administrator, NPS.

Administrator's Council

The Administrator's Council (AC) is established by the Administrator to provide a forum for communicating among the Area Offices, NAL, and Headquarters. The AC is chaired by the Administrator and is comprised of the following:

- Administrator
- Associate Administrators
- Deputy Administrators of AFM and NPS and Associate Deputy Administrators of NPS
- Assistant Administrator for Office of Technology Transfer and Director of Homeland Security
- Area Directors and the Director of the National Agricultural Library
- Director, Budget and Program Management Staff
- Director, Information Staff
- Director, Office of Civil Rights
- Chief Information Officer
- Director, Office of International Research Programs
- Administrator's other senior advisors including the Senior Legislative Affairs Analyst and the Special Assistant to the Administrator

The AC meets quarterly for general and executive sessions. The purpose of these sessions is to keep the AC informed on matters important to the Agency and to gain input from the AC on these matters. Decisions on policy and other items are made during these meetings. Action items are produced and assigned to responsible parties. The general sessions of the AC are open to any interested party, while the executive sessions are attended by the AC principals, with others invited as specialists on topics to be considered. Periodically, the

Administrator will call a special session of the AC where the purpose is specific and usually entails program planning or visioning. These sessions are typically closed.

APPENDIX 2: TIMETABLE FOR DEVELOPING THE PRESIDENT'S BUDGET

NPS is often working on three FY budgets—the current one, the proposed President's budget (for the following year), and the budget for the next year. For practical purposes, the ARS budget cycle begins in February.

February/March (Beginning the budget cycle for the next Fiscal Year)

- Budget Team is appointed by the Deputy Administrator, NPS, to oversee development of the ARS budget for the subsequent fiscal year.
- Area Directors are asked to identify a few top-priority issues of national or regional significance that need to be considered in the budget development process.
- For each issue identified, the Area Directors will develop one or two paragraphs that:
    - Identify each problem,
    - Propose possible solutions, and
    - Identify the resources needed to address the problem.

April 1 – Area Directors' budget items are due to the NPS Budget Team.

April/May – NPS Budget Team:

- Reviews the Area Directors' high priority proposals to ensure that they are consistent with the vision, mission, and goals of the National Program(s) that would address these issues.
- Develops the "Agency Estimates" (the document that transmits the ARS proposed budget to USDA).

May/June – NPS Budget Team and BPMS brief the Area Directors on the "Agency Estimates" during the May/June Administrator's Council meeting.

July – ARS submits its budget request to the Office of the Secretary.

August/September

- USDA provides specific guidance to ARS regarding its budget request and how the Department would like to see the request revised.
- ARS responds to the USDA input on its budget.

September –NPS Budget Team and BPMS brief the Area Directors on the "Department Estimates" (the document that transmits the USDA proposed budget to OMB) during the September Administrator's Council meeting.

September/October –NPS prepares an implementation plan based on the Department Estimates

October 1 – Annual research project report (AD-421) are due from the Area Offices to NPS.

October/November – National Program Leaders review all AD-421 reports to identify significant research accomplishments for use in the next fiscal year's Explanatory Notes ("green sheets"), the preceding year's National Program Annual Report.

November – OMB provides USDA (and ARS) with the "passback" (OMB's response to the Department's budget request). On the basis of this information, NPS and BPMS recommend which issues to ask the

Department to appeal and how to fund new Presidential Initiatives that may be requested in the "passback."

December/January

- Negotiations between ARS, USDA, and OMB continue until all outstanding issues are resolved.
- NPS works with the Area Directors, BPMS, and the Information Staff to develop a communications strategy that is timed to the release of the President's budget to Congress (early February). The communications strategy provides information to ARS employees, customers, stakeholders, partners, and the public about the ARS budget request.

February – the President announces his budget request for the next fiscal year to Congress.

February/October +

- The President's budget is assigned to the House and Senate Appropriations Committees and the USDA request is further referred to the appropriate subcommittees.
- Hearings, as determined by the subcommittee, are held that may include receiving testimony from the Under Secretary for REE, the ARS Administrator, customers, stakeholders, partners, and other witnesses.
- The congressional budget process will set overall spending levels for the Appropriations Committees.
- In both Houses, the Agriculture subcommittees and the full Appropriations Committees will hold a series of "mark-up" sessions to establish the funding levels for USDA, including ARS.
- Both the House and Senate approve their versions of the USDA appropriations bill.
- A joint House/Senate Conference Committee (made up of members from both Houses) meet to resolve differences in the House and Senate passed versions of the bill. The legislation reflecting the agreed upon funding levels is called a Conference Report, which is not open to further amendment.
- Both Houses approve the Conference Report.
- The bill is sent to the President for signature (or veto).
- After the bill is approved by the President, OMB apportions the funds to the Department, and USDA can begin to operate at the approved funding levels.