Multistate Research Fund: A Research Program that Promotes Relevance, Excellence and Accountability

Background The Hatch Act of 1888 established in each state an agricultural experiment station for the purpose of carrying out research that is relevant to the agricultural sector of the state. This sector includes but is not limited to agricultural production, environment and natural resources, food and nutrition, and family and rural community development. The Agricultural Research, Extension, and Education Reform Act of 1998 (AREERA) amended the Hatch Act to identify the Multistate Research Fund (MRF) (previously named the Regional Research Fund). The amendment specifies that:

> "Not less than 25 percent shall be allotted to the States for cooperative research employing multidisciplinary approaches in which a State agricultural experiment station, working with another State agricultural experiment station, the Agricultural Research Service, or a college or university, cooperates to solve problems that concern more than 1 State. The funds available under this paragraph, together with the funds available under subsection (b) for a similar purpose, shall be designated as the `Multistate Research Fund, State Agricultural Experiment Stations'."

The multistate research portfolio is designed to encourage and increase multistate collaborations on critical issues that have a national or regional priority. Given the current fiscal climate, increasing integrated multistate efforts to meet local, regional and national research goals is critical and will likely increase. Individual states cannot continue to do all things to meet all needs, and are increasingly dependent on multistate, multidisciplinary approaches to research and outreach activity. Indeed many of the problems that today's scientists are trying to resolve require this multistate, multidisciplinary approach.

Total Hatch appropriation is on the order of $180M with approximately $45M (25%) expended on multistate activity. A brief description of the process used to establish multistate research projects will demonstrate that this is an important component in the portfolio of funding mechanisms used to carry out federally supported research for agriculture.

Criteria for Multistate Research Projects

The origin of ideas for multistate projects most often begins with a broad group of stakeholders who interact with faculty and staff at the agricultural experiment stations (SAES's). Consequently, the projects address problems or issues directly confronting stakeholders that require further research for resolution. Faculty and staff then generate a project proposal that is submitted to one of the four geographical regional associations of agricultural experiment station directors. The project is then subjected to the policies and procedures governing the multistate research fund program. The policies and procedures are contained in the National Multistate Guidelines available at:
http://www.cals.ncsu.edu:8050/escop/NRSP%20Guidelines%20Jan%202004-2.pdf.

Each multistate project is required to meet the following criteria (quoting from the Guidelines):

> "A Multistate activity involves cooperative, jointly planned research employing multidisciplinary approaches in which a SAES, working with other SAES, the Agricultural Research Service (ARS), or a college or university, cooperates to solve problems that concern more than one state and usually more than one region. In addition, the following must be demonstrated in the project proposal:
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> 1. The objectives are clearly focused.
> 2. Each participant listed has direct involvement in the accomplishment of the stated objectives.
> 3. The project is multistate and multidisciplinary.
> 4. The project proposal has been peer-reviewed.
> 5. The proposed project is oriented toward accomplishment of specific outcomes and impacts and based on priorities developed from stakeholder input.
> 6. The project is responsive to CSREES goals."

Review Procedures for Multistate Research Projects

Multistate research projects are subjected to a two stage review/approval process to become eligible for an experiment station director to allocate funds to a researcher from the Multistate Research Fund. During the initial stage a pre-proposal is developed and reviewed by a committee of department heads from relevant disciplines and/or a committee of experiment station directors. This review assures that the general approach being proposed has merit, that faculty with appropriate expertise are involved, and that the proposed activity is relevant to current needs of industry and other stakeholders. The second stage involves development of a full proposal and a rigorous peer review for scientific quality. This review is conducted by scientists not associated with the project but knowledgeable in the subject matter. Concerns that are identified in the peer review process must be addressed in subsequent revision of the proposal in order to obtain approval. A committee of experiment station directors again reviews all revisions to assure appropriate responses to the concerns raised in the review process. A final recommendation is then made to the entire group of experiment station directors for that region. The regional association then reviews the project proposal before final approval by the regional association. The ultimate objective of this portion of the peer review process is to demonstrate that the proposed research is of the very highest scientific quality, is multistate, is interdisciplinary, meets stakeholder needs, and is consistent with regional and national goals.

After approval of the project by the regional association, the project is then submitted to CSREES where one or more CSREES national program leaders subject the proposal to review. This part of the review is to ensure compliance of the project with requirements specified in the National Multistate Guidelines.

There is yet another peer review that occurs within an approved multistate project. Each participant in the project must generate a project proposal that contains one or more of the exact objectives as stated in the multistate project. Each participant then describes within his/her specific proposal the procedures and methodology that will be used in his/her specific project to achieve the objectives. Since the multistate project must be "multistate" and interdisciplinary, the investigator must demonstrate that his/her specific project contributes to achieving these dimensions of the multistate project.

Responsiveness of the MRF

One of the mechanisms that separates and distinguishes the MRF from other funding mechanisms is the rapidity with which research projects can be initiated to meet rapidly emerging needs as identified by scientists and stakeholders. These regional MRF projects can be established within a matter of a few days based on stakeholder needs and scientific interest. Several recent examples of rapid response to meet emerging needs are cited below.

- Karnal bunt infestation in wheat, a pest infestation that first appeared in 1997 in the US, could cause untold damage to the wheat production system of the US if not held in check. Today a group of scientists from appropriate disciplines are attacking the problem.

- Another rapid response project is addressing the potentially devastating disease of transmissible spongiform encephalopathies. This group of diseases includes "mad cow disease" and "chronic wasting disease" and represents a family of emerging, potentially zoonotic diseases affecting US Agriculture and Wildlife management. While most of these disorders are species-specific, they have the potential to cause massive economic losses due to general concern over the potential consequences of a zoonotic spread.

- In the northeast US, during the last several years, fruit growers in New York, Pennsylvania, and New Jersey have suffered severe financial losses because infestations by internal fruit feeding *Lepidoptera* have led to numerous loads of apples being rejected by fresh fruit markets and processing plants. The escalating incidence of severe fruit damage in commercial apple orchards caused by internal fruit feeding *Lepidoptera* clearly poses a threat to the continued viability of this industry.

• Finally the disease organism attacking oak trees in the US has been addressed through a rapid response project. *Phytophthora ramorum* is the cause of "sudden oak death" on certain members of the *Fagaceae* and ramorum blight of many nursery crops. The pathogen was first identified in 1993 in Germany and the Netherlands on *Rhododendron* and *Viburnum*. It is now causing widespread disease in nurseries within nine European countries. Research is necessary because the climatological requirements and ecological constraints of this pathogen are not known, and eastern red oak forests are at risk because they contain numerous susceptible hosts including *Quercus falcata, Quercus rubra, Kalmia latifolia,* and *Rhododendron*.

The MRF rapid response mechanism has allowed the experiment station system to respond with scientists of the appropriate disciplines to address the research needs of these important problems. Each of these projects was established within a matter of a few weeks time. Under no circumstances could a traditionally competitively awarded program have responded to these important problems with the expertise that was needed within such a short time period.

Efficiency and Effectiveness of the MRF

Given the review process that has been detailed above, it should be quite clear that the MRF system of developing and implementing research programs that are responsive to stakeholder needs is efficient and effective. From the outset of a project, a CSREES Program Leader is assigned by CSREES to the project. This assures that the project is aligned with the goals of the agency and USDA. Furthermore, every MRF project must document its effectiveness through submission of the annual SAES-422 form, an accountability statement generated by the scientists that documents the accomplishments and impacts of the project. The CSREES Program Leader on the project and the project Administrative Advisor annually review the impact statement, another form of peer-review.

The MRF program has a further advantage lending to its efficiency by having the potential to involve multiple partners without the use of burdensome subcontracts. The call for participation in projects is widely distributed, and most projects have participants from the private sector, federal government laboratories (such as DOE scientists, ARS scientists, etc.), and non-land grant universities. Finally, the MRF program has the ability to not only bring scientists from widely disparate fields together from far-ranging funding sources but also to leverage the investment from these sources to address the research issue. The National Research Support Projects (NRSPs) are a good example of leveraged funding. Currently these 7 projects are undergoing a thorough review by the NRSP Review Committee. In justifying the investment that the MRF is making in the project on atmospheric deposition (NRSP 3), it was demonstrated that an annual investment of $112,000 was leveraged 27 to 1 (i.e. total research investment of over $3,000,000). It is doubtful that many NRI, NIH or NSF projects can claim that leveraging power.

Multistate Research Funds as Part of a Portfolio of Funds

Within federally funded research, there are several mechanisms for allocating funds to research projects. Two of the most common are competitive grants programs and Congressional earmarks. In USDA, both of these mechanisms are used along with Hatch funds to support research directed to achieving the goals of the USDA. As noted above, the multistate research funds are mandated under Congressional legislation. Although the Multistate Research Fund is not awarded in a competitive manner similar to the NRI (USDA/CSREES National Research Initiative), NSF (National Science Foundation), or NIH (DHHS National Institutes of Health), it nonetheless seeks to address stakeholder input, to meet high priority regional and national needs that are not easily addressed with other funding sources, and to draw upon the collaborative strength of the land grant universities and their partners. Among all the funding sources mentioned above, the Multistate Research Fund is the only mechanism where 100% of the funds are used to enhance multistate, multidisciplinary research. In addition, these funds are used to leverage a significant amount of funding from other federal, state, and private sources. As shown above, the research is subjected to more peer review by scientists than any other competitively awarded research grant. Finally, this system of projects focuses the unique capacity of the state agricultural experiment stations and their collaborators on important issues facing US agriculture, the environment and natural resources, food and nutrition, and family and rural community development.

Currently there are approximately 170 multistate research projects and 7 national research support projects. For the period 2000 – 2004, more than 90% were revised with peer-review input. This is a testament to the quality of the peer-review system employed in the MRF. Furthermore, approximately 8% of all new project proposals and 8% of all renewals were rejected for a variety of reasons. The MRF is an excellent, responsive, effective funding mechanism addressing relevant researchable issues. It is a fundamental cornerstone that complements other competitively awarded research projects.

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