

CSREES Portfolio Review Expert Panel Report

Portfolio 1.5.1 Plant Production CY 1999-2003

REPORT

External Review Completed: May 2004

Portfolio Overview

The CSREES Plant Production Portfolio has been defined as those research, extension, and education programs aligned with six knowledge areas (KAs) related to the efficiency of plant production systems. The CSREES Plant Protection Portfolio includes new, emerging, and reemerging plant diseases, plant agricultural security, biosecurity, and toxicology. In describing and reporting on the performance of the portfolio, it is important to recognize that an integrated systems approach is utilized in planning, developing, and implementing programs.

The PPP is diverse in terms of commodities covered. The portfolio includes research and extension activities directed at plant production systems. While broad goals and needs are similar across the various commodities, there are specific needs and priorities within these commodities that are addressed in the portfolio. Program goals and delivery systems also recognize the diversity of needs across and within these commodities in terms of size, concentration, regional differences, levels of integration, and external factors that impact these systems.

The PPP encourages multi-disciplinary approaches that both address the needs of plant agriculture and the American consumer. This portfolio contains a balance of discipline-based components including plant reproduction, genetics, physiology, and product quality. The portfolio also includes integrated system-based research and extension programs. Program integration may occur at a commodity-based system level (e.g., rice or corn), or at a biological/discipline system level (e.g., genetics). As much of the research is applied by its very nature, the extension component is highly integrated and not always evident as a separate effort.

The Team recognizes that the long-term goals of the programs within this portfolio can best be achieved through strong research, extension, and education programs that are clearly integrated with one another. While the portfolio represents a complex system in terms of functions and the integration of these functions, there is a critical need to develop new models and delivery systems that are effective and performance based. Integrated program functions for the PPP include:

- Originate fundamental knowledge from basic research at the frontiers of the biological, physical, and social sciences in plant agriculture.
- Produce, apply, and adopt applied research-based knowledge in innovative ways to address problems and issues in plant agriculture.
- Provide developmental research and technology transfer to promote the commercialization and transfer of technologies and practices to potential users in a timely, cost-effective manner.
- Provide leadership in the delivery of research-based knowledge through extension, outreach, and information dissemination to strengthen the capacity of public and private decision makers impacting plant agriculture.
- Strengthen the capacity of institutions of higher education to develop the skills of the Nation's workforce in the food and agricultural sciences.
- Assure the quality, relevancy, and performance of programs supported through federal funding in plant agriculture.

- Optimize collaboration and cooperation across institutions and agencies in order to achieve broad strategic goals addressing the needs of farmers, ranchers, and the American consumer.

The portfolio consists of the following Knowledge Areas:

- KA 201 Plant Breeding, Genome, Genetics, and Genetic Mechanisms
- KA 202 Plant Genetic Resources
- KA 203 Plant Biological Efficiency and Abiotic Stresses
- KA 204 Plant Product Quality and Utility –Preharvest
- KA 205 Plant Management Systems
- KA 206 Basic Plant Biology

Comments on Research & Development Criteria and Dimensions

In 2004 a panel comprised of independent experts from the field was convened to assess and score the current state of the Plant Production Portfolio. A discussion of specific comments and recommendations related to each of the dimensions of the three Office of Management and Budget (OMB) research and development (R&D) criteria used (relevance, quality, and performance) is provided below.

Relevance

Overall, the Review Panel believes that the relevance of the Plant Production Portfolio is very good. The chief weakness relates to integration of education and extension with research. This is partly, though not entirely, due to the current reporting systems. Improvement in the collection of appropriate outcomes and impacts for extension and education will greatly improve the overall issue of integration. Likewise, a more active role in multistate projects and more discretion to support conferences would facilitate improved two-way communication with regional, state, and local stakeholders.

Scope

The Review Panel believes NPLs are well informed and that shifts have been made in changing the funding priorities. However, the extension and education links are not clear and the Panel believes that better education, outreach and public relations could be done to inform the consumer/customer about activities and outcomes. All areas appear to be covered as adequately as funding levels permit.

Focus

Although the Portfolio focus is good overall, it is still somewhat reactive. One systemic weakness is the lack of a current CSREES strategic plan.

Emerging Issues

The Panel believes that sustainability, green industry, organic farming, and agro-forestry are emerging issues not adequately covered by the Plant Production Portfolio. Similarly, capitalizing on the link between nutritional plants and human health is an issue not adequately addressed in the Portfolio report. The Panel suggests that Homeland Security issues such as security of genetic and other plant-related resources is also an emerging issue that the Portfolio should consider.

Integration

Research projects enable students and postdoctoral fellows to conduct research and continue their education. The Panel looked for collaboration between Higher Education Programs and NPLs but did not find evidence that NPLs are aware of what is already being done. Similarly, extension evidence was missing, with the exception of the mention of the Master Gardener program. One systemic problem is the need for a good reporting system for extension and education; currently there is no good structure in place to help NPLs make the education/extension/research connection. The Panel is encouraged that a combined, extension/research reporting system is being developed which will help alleviate this problem. However, it also encourages a combined system that includes education.

Multidisciplinary Balance

The Panel had difficulty judging this aspect of the Portfolio because complete evidence was not available. Although the Portfolio shows some evidence of multidisciplinary research projects, not much was shown regarding multidisciplinary and inter-functional education, extension, and research projects. The Panel did not see examples combining engineering, economics, and other disciplines and suggests that metrics be designed for applied projects so that there are appropriate measurements for related impacts.

Quality

The data presented was of high quality, but metrics were limited and not presented for all areas. It is clear that CSREES needs an effective reporting system and to better delineate Portfolio goals and objectives.

Significance of Outputs and Findings

There were few examples of significant outputs and findings presented in the Portfolio. Ultimately, the system depends on states providing examples of significant outputs and impacts, but better communication between Federal-state partners would enhance this aspect of the portfolio. A summary of known outputs and impacts also would have been useful.

Stakeholder Input

The Plant Production Team has done a good job of garnering stakeholder input from a variety of sources, including professional society meetings, workshops, and advisory boards.

Portfolio Alignment

By cooperating with states as mandated, CSREES has effective control of Portfolio alignment. The NRI Competitive Grants Program has shifted its areas of emphasis over the years and is in alignment with the current state of Plant Science. The NPLs are knowledgeable and obviously help in this process.

Appropriate Methodology

The research methodologies are based on peer review and therefore, appropriate. The lack of good evidence for extension and education methods is a weakness of the Portfolio.

Performance

Overall, to fully judge this Portfolio, additional documentation and evidence is needed. A Review Panel must be able to better understand the indicators about which it is asked to comment. The

Panel rated this performance area adequate, although this was done on the basis of personal experience and not presented evidence. The Portfolio needs to address the issue of documentation and evidence and implement a better reporting system before the next review.

Portfolio Productivity

The Review Panel would have liked to have seen more evidence of productivity, such as lists of publications, patents, and other social or physical measures. Economic impacts also were lacking. There needs to be a better system for reporting and tracking such metrics.

Portfolio Completeness

The Review Panel's comments for this area are similar to those expressed in Portfolio Productivity. The Review Panel was not presented with sufficient evidence to judge completeness of the Portfolio.

Portfolio Timeliness

The comments for this area are similar to those above. The Panel members' own experience is that the Portfolio reports, etc. are handled in a timely fashion, but documentation was insufficient to judge this to be so.

Agency Guidance

The Review Panel was unclear how to evaluate this aspect of Performance. Solicitations are fair, if this is what was meant in the description of Agency Guidance. Otherwise, the Panel had limited information. A complete description of the NPL role would be useful (including CVs), as would a detailed organizational chart. NPLs appear to be mostly reactive, not proactive, though they do not have control over most funding aspects of their jobs. Their participation in departmental and program reviews within the state institutions and technical committees is very helpful.

Portfolio Accountability

The language associated with the description of this Performance aspect is unclear. For example, a score of three is impossible to achieve as worded.

Comments on Future Directions Presented by CSREES

Recommendations regarding the preparation of future Portfolio self-reviews:

- NPLs should use a common format to describe their KAs. This would aid Review Panel in assessing the status of the entire Portfolio.
- Administrators should prepare and include in the Portfolio documents a clear, comprehensive description of the role of the NPL; individual NPLs have different perceptions of their role.
- The Portfolio documents should include an organizational chart and a list of NPLs with their backgrounds and expertise.
- The Portfolio documents should include a state-by-state breakdown of information.
- The Portfolio documents should include more managerial level summary statistics such as SYs (Scientist years), PYs (Professional years); Graduate Student and Post Doctoral Students numbers.

The following are comments the Panel made on constraints faced by NPLs in the performance of their roles and future directions of the Portfolio:

- Control and funding of most programs reside at the state level and performance resides with the individual scientists within the State Agricultural Experiment Stations (SAES) and 1890 Research Programs.
- The Plant Production Portfolio has heterogeneous responsibilities distributed among NPLs. Some NPLs are responsible for competitive grants programs and are not within the same unit as the other NPLs.
- Optimal integration of education, extension and research is still not apparent ten years after the creation of CSREES from the Extension Service and CSRS.
- Reporting of extension and education activities through a CRIS-like system would help the NPLs provide better management in their performance.
- The lack of discretionary funds hinders the ability to develop such things as workshops and conferences.
- Administrative leadership is lacking, or financial constraints prevent NPLs from having an active role in multistate research projects.
- NPLs rely on outputs from the states. What NPLs can show depends on what they receive.
- Defining and strengthening NPL roles and expectations in extension and education is needed.
- NPLs need sufficient support staff to assist them with their heavy assignments if they are to be successful in expanded education/extension/research assignments.
- The Panel believes that sustainability, green industry, organic farming, and agro-forestry are emerging issues that should be pursued by the Plant Production Portfolio.
- The Portfolio should capitalize on the link between nutritional plants and human health.
- The Panel suggested that Homeland Security issues such as security of genetic and other plant-related resources is also an emerging issue that the Portfolio should consider.
- The Review Panel strongly recommends a balanced Portfolio with regard to formula funding and competitive grants; one should not be increased at the expense of the other.
- Higher Education Programs support agricultural industries by providing people with advanced degrees and internship experience. Education and training of undergraduate and graduate students and post-doctoral fellows are integral components of state research programs and, hence, of federal programs. The Portfolio should be able to present how graduate education, undergraduate education, and training of postdoctoral fellows are enhanced by its program activities.
- The Panel recommends that the plant production programs be examined with other areas, such as pest management, soils, and soil fertility. The current arrangement fosters artificial divisions by separating agronomic/horticultural plant production from plant protection and natural resources (e.g., soils). This presents difficulties when the Panel tried to align the goals and objectives of the plan with agriculture as practiced, holistically.
- Again, the Panel suggests that more integration of extension and education be integrated into the Plant Production Portfolio. The logic models are a positive step towards clarifying where extension and education fit into the Portfolio scheme. This should be a platform for presentation of role description and job performance.
- The Panel recommends that the CSREES Administrator issue guidance to the Land-Grant system regarding the uniform funding and management of multi-state projects (MRF), multi-state extension activities, and integrated activities. Furthermore, we urge the Administrator to re-establish a management-level position occupied by a “chief scientist” whose primary responsibility rests in the area of multi-state research, multi-state extension, and integrated research and extension.

Data Issues

In general, the availability, quantity and quality of data on integration of research, higher education, and extension were among the most obvious shortcomings of the CRIS system, evidenced in the self-review document and NPL oral presentations. The Portfolio needs to address the issue of documentation and evidence and implement a better reporting system.

There needs to be more evidence available that shows the productivity and economic impacts of the Portfolio. This evidence might include lists of publications, patents, and other social or physical measures.

The Panel found a few examples of significant outputs and findings presented in the Portfolio. Ultimately, the system depends on the states providing examples of significant outputs and impacts, but better communication between Federal-state partners would likely enhance this aspect of the portfolio.

Evaluation Issues

There is no evidence of the Portfolio's productivity and impacts, such as social or physical measures. that would have come from program evaluation results.

The Panel suggested that performance indicators be presented to make it possible for the Panel to fully judge the performance and completeness of the Portfolio. Also, CSREES and NPLs should have better communication with state partners in order to get significant evidence of outputs and impacts.

Summary of General Comments and Recommendations

The Review Panel commends the Plant Production Portfolio National Program Leaders (NPLs) for the enthusiasm and professional competence exhibited in their presentations. They are fully engaged with multiple responsibilities which include:

- involvement in formula-funded project review and approval,
- the management and directing of Special Research Grants,
- administering and advising multistate research projects,
- managing and directing funding of National Research Initiative and other competitive grant programs,
- serving as liaisons with various farm groups,
- involvement in strategic planning,
- reviewing state plans of work and annual reports of accomplishments.

The Review Panel also recognizes that there are significant constraints faced by NPLs in the performance of their roles:

- Control and funding of most programs reside at the state level and performance resides with the individual scientists within the State Agricultural Experiment Stations (SAES) and 1890 Research Programs.
- The Plant Production Portfolio has heterogeneous responsibilities distributed among NPLs. For example, some NPLs are responsible for competitive grants programs and are not within the same unit as the other NPLs.
- Optimal integration of education, extension and research is still not apparent ten years after the creation of CSREES from the Extension Service and CSRS.
- Reporting of the activities of extension and education through a CRIS-like system would help the NPLs better manage performance.
- The lack of discretionary funds hinders the development of such things as workshops and conferences.
- Administrative leadership is lacking, or financial constraints prevent, NPLs from having an active role in multistate research projects.
- NPLs rely on outputs from the states. What NPLs can show depends on what they receive.

- Defining and strengthening NPL roles and expectations in extension and education is needed.
- NPLs need sufficient support staff to assist them with their heavy assignments if they are to be successful in expanded education/extension/research assignments.

Portfolio Score

Portfolio 1.5.1 received a total score of 81 from the panel. This score places the portfolio in the category 'moderately effective in supporting CSREES objectives.'