CSREES Portfolio Review Expert Panel Report

Portfolio 3.2.1 Plant Protection
CY 1999-2003

REPORT

External Review Completed: March 2005

Portfolio Overview

The CSREES Plant Production Portfolio includes research, extension, and education programs aligned with six Knowledge Areas (KAs) related to the efficiency of plant productions systems. The CSREES Plant Protection Portfolio includes new, emerging, and reemerging plant pests and diseases, plant agricultural security, bio-security, 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 KAs covered are as follows:

- KA 211 Insects, mites and other arthropods affecting plants
- KA 212 Pathogens and nematodes affecting plants
- KA 213 Weeds affecting plants
- KA 214 Vertebrates, mollusks, and other pests affecting plants
- KA 215 Biological control of pests affecting plants
- KA 216 Integrated pest management systems

The CSREES National Program Leadership Team for Plant Systems recognizes that the protection and production components are closely linked and interdependent in terms of program development, implementation, and delivery. The Team also recognizes that these components are linked to other major programs areas such as product quality (post harvest), food safety, engineering, waste management, marketing, and economics.

The Plant Protection Portfolio is diverse in terms of commodities covered. The portfolio includes research and extension activities directed at plant protection 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 impacting these systems.

The Plant Protection Portfolio encourages multi-disciplinary approaches to address the needs of plant agriculture and the American consumer. The portfolio contains a balance of discipline-based components including all major grouping of pests affecting plants and the integration of these into pest management systems. Program integration may occur at a commodity-based system level (e.g., rice or corn), as well as a biological/discipline system level (e.g., genetics). As much of the research is very applied in nature, the extension component is highly integrated and not always evident as a separate effort.

Comments on R&D Criteria and Dimensions

In 2005 a panel comprised of independent experts from the field was convened to assess and score the current state of the Plant Protection 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

Scope

Overall, the document and presentations were well put together. Scope is wide, but perhaps not balanced. Materials presented did not allow for major issues that were not covered to be identified.

Focus

There is focus on matters of national significance, and there is a process in place to deal with issues as they arise. The portfolio's ability to remain focused on time sensitive needs is outstanding, but not enough information exists to make evaluation on all issues possible. Funding is spread too thinly across too many areas, affecting the Portfolio's ability to remain focused.

Integration

Although many programs are highly integrated, research and extension are not really integrated very well nor is higher education incorporated with the other areas. Extension is critical but there is not much evidence of it. The same is true of higher education.

Multidisciplinary Balance

All of the relevant disciplines are covered, but coverage is not always properly balanced. For example, Integration Pest Management Systems only has one person, and there are also not an adequate number of plant physiologists or agronomists. There seems to be an over representation of entomologists.

Quality

Significance of Output and Findings

Areas like IR-4 are bona-fide winners, but there are other areas that are not at the same level of quality. Moreover, for the funded amount, it is not possible to know whether adequate information on outputs and outcomes gets to the end-users.

Stakeholder Input

Stakeholder/constituent input is evident and thought to be sufficient. IPM centers and professional societies are to be complimented for their work in this regard and NPLs do attend occasional meetings. However, there needs to be a systematic method put into place that reliably gets information to the end-users. The Portfolio has conducted workshop for the end-users but additional ones need to be provided. Also, NPLs need to make sure they receive and use information from state partners.

Portfolio Alignment

The portfolio has shown good improvement from 1999-2003. There is good alignment in some areas such as plant pathology, but alignment should be evident in other sciences, such as weeds and entomology.

Appropriate Methodology

The portfolio has shown good improvement over the years. However, there lacks evidence that all KAs were necessarily using the cutting edge technology.

Performance

Portfolio productivity

Productivity was high, and might increase pending increased funding. Some productivity evidence was not presented but the Panel is aware of examples that could have been used. It would be useful for the Panel to have measures of productivity per dollar spent.

Portfolio comprehensiveness

The Portfolio showed gaps in its comprehensiveness evidenced in the imbalance across the various KAs. Also, reporting of outputs should be more comprehensive.

Portfolio timeliness

The Panel believed that most Portfolio projects were completed within the allocated time frame. The lack of evidence demonstrates the need to get adequate information on the number of projects that were completed on time.

Agency Guidance

There is some evidence of good portfolio leadership. However, insufficient information concerning how the portfolio is actually managed was provided. For example, evidence of accomplishments was lacking. Management responsibilities for NPLs should be better defined.

Portfolio Accountability

There is a lack of sufficient data necessary to evaluate the accountability of the Portfolio. For example, there is no information on the performance of Portfolio projects even after termination. CRIS reports do not allow for/require post-termination reporting in order for information on post-termination activities/results to be captured.

Comments on Future Directions presented by CSREES

CSREES must articulate a new, shared vision and communicate the vision of the portfolio more aggressively both internally and externally

Plant protection priorities and programs need to be more visibly tied to and integrated into the issues of global competitiveness, and homeland and biosecurity /food security issues across the nation.

Plant protection (and production) efforts must better link homeland security funds to invasive species. This is potentially a huge issue.

NPLs roles must be better defined to allow for stronger program leadership and vision. NPLs need to dedicate greater commitment to national leadership in portfolio management issues. CSREES must recognize that there is less societal value or overall impact to stakeholders if a NRI- only approach takes place within CSREES.

CSREES must assist in systematically delivering information to broader audiences including end users through local partners and extension at the local level. Research remains the main focus, but extension is critically important. This is especially true for reaching the end-user and the private sector. Both can benefit from this type of information. A thorough mechanism needs to be in place to ensure dissemination of this information and implementation of viable measurement tactics for impacts.

CSREES needs to encourage the routine and timely exchange of information between sister agencies. It also needs to empower individual NPLs to assume more visible and creative leadership positions and functions in such interchanges.

Funding

The Panel firmly believes that there is still a strong need in CSREES for a targeted, non-competitive plant protection grants/investment strategy. This is in addition to a competitive grants approach and it is needed to maintain the infrastructure and strong base support at the Land-Grant University and local level. NPLs need to be supported and trained to fulfill both of these functions.

CSREES should establish or reaffirm a policy requiring institutions to cite sources of funding in all publications from projects supported all or in-part by competitive and/or formula funds.

Direct evidence or transparency of budget planning and the relationship to targeted goals within the knowledge areas in plant protection need to be improved, focused, and communicated more effectively.

Leadership

CSREES, through its NPLs and administrative leadership, needs to be a stronger and more visible voice and leader for needed and coordinated research. There needs to be a more transparent function in CSREES that can provide visible leadership, coordination, and communication of on-going and needed research. Insufficient communication leads to a lack of knowledge of what others are doing and the potential for duplication of efforts. The Panel does note that some duplication is appropriate, productive and may lead to the development of multiple solutions for the same problem. However, it still believes that sharing of ideas has utility.

Partnerships

The SARE program provided a working model for stakeholder involvement, input, and dissemination at the local level. Appropriate approaches and activities of SARE should be adapted to CSREES programs in plant protection and led to greater impact and visibility.

Review Period

The review period is very short; departmental and program reviews last almost a week and at times, have evening sessions. The Panel would have preferred more time to really immerse themselves in the evidentiary materials.

NPL Roles and Responsibilities

The expectation is that NPLs will be influential leaders affecting change within CSREES and across the Land-Grant University system. NPLs need to be supported in their leadership opportunities and understand the expectations others have of them. Grants management activities are one of their functions, but not their primary function. NPLs must be in positions where they are involved with interdisciplinary interest groups, within and outside of CSREES, related to plant protection and production systems. Clear levels and expectations of leadership need to be defined for NPLs. One barrier to this is that it may be unclear whose responsibility it is to become involved. It could be that there is no NPL on the Department's Coordinating Committee because there is not one NPL that falls under Integrated Pest Management Systems (IPM), but twenty-seven. This leads to some ambiguity of responsibility and a need for clarification. There also needs to be some formal coordination between groups within CSREES without adding undue administrative oversight.

<u>Data Issues</u>

The Panel recognized subtle, but inherent problems ingrained within the CRIS system. It needs to be improved to allow NPLs to retrieve data and PIs to report data with greater ease. CRIS reports make it very difficult to gather timely information for an evaluation, especially over a short review period.

For grant-supported projects, the present CRIS system does not allow for accomplishments to be reported once the funding period concludes which leads to incomplete information and, at times, lost reporting of the more significant publications, patents and accomplishments that come about after the project termination period. A minimum of a two-year post project reporting period is suggested along with a plan for systematically capturing impact data and accomplishments to accurately illustrate the impact of CSREES investments. In addition, the current CRIS system does not allow for the easy or accurate capture of the States' contributions or resources of extension activities. Portfolio work is highly leveraged by the states. This aspect needs to be better measured and reported by CSREES.

It is difficult to show either how CSREES drove the impact of the projects from the self-study report or what the state contributions were in research and extension activities. The Panel therefore suggests there is a need for a better a tracking system for funded projects. Modification of the CRIS system to include extension efforts will better meet overall CSREES and Land-Grant needs. Additionally, an improved working partnership is needed. A simple, focused summary of CSREES total statistics and data would enhance CSREES's credibility, understanding, and function for reviewers and the public.

<u>Evaluation Issues</u>

Self-Review Report: The document itself had both substantial redundancy and gaps. This made it difficult to ascertain pertinent, succinct information. It was also difficult to review this portfolio without knowledge of what was covered or what interactions/relationships exist in relation to other portfolios such as plant production. It is understood that, in order to make the topic manageable, related areas had to be artificially separated (e.g., protection; soil, air and water), but it would be useful to have these documents available during the review period so that panel members are able to identify existing gaps.

The document appeared to be deficient in several areas. As far as content, higher education and extension frequently appeared to be "after-thoughts" in the document. There was little focus, direct linkage or synergy with higher education, even though it seems to be important to the overall portfolio. Empirical evidence surfaced on higher education but NPLs awareness and direct linkage to, knowledge of and interactions with higher education were less well understood or evident. In addition shared goals were not evident.

The portfolio also does not sufficiently capture the communication/extension function of plant protection. Extension and research were individually compartmentalized in some areas where stronger integration was needed. A part of this difficulty was related to the capture of data, outreach, impacts and accomplishments of the extension function that presented how many projects achieved closure on time. There was also insufficient quantification that led to the inability to fairly judge the portfolio on accountability and timeliness.

NPL's may not have access to the best or most recent information on given topics. Therefore, it might be beneficial to consult other sources for a more comprehensive and detailed view of projects and programs scope and impacts.

Summary of General Comments and Recommendations

Overall, the program was very impressive; this was good quality work. The Panel sensed that the Plant Protection Portfolio was well integrated and found it to be impressive. With respect to funding, the fact that CSREES only has a 4 percent administrative cost is remarkable. The Panel believed that, for the amount of funding provided and invested, the NPLs are doing a great job. The Panel also recognized IR-4 reporting, SARE partnerships, The Plant Diagnostic Network, IPM Regional Centers, and the Invasive Weeds program as areas of particular visibility and success.

NPLs have many responsibilities and are very busy, but their dedication to a high quality product and the portfolio review process was evident. NPLs obviously took considerable time and effort to put this information together and it was appreciated by the Panel. Also, the honeycomb feature was especially creative and useful. It was well received among Panel members as an effective tool to describe working relationships and program interactions.

Portfolio Score

Portfolio 3.2.1 received a total score of 80 from the panel. This score places the portfolio in the category 'moderately effective in supporting CSREES objectives.'

APPENDIX A

Comments and Recommendations for Plant Protection Areas of Science

Insect, Mites and Other Arthropods

Strengths

- Overall scope is thorough.
- Informal links are evident and exchange of information with groups is apparent.
- Honeycombs tie things together well.
- Communication is generally good.
- Substantial work element is evidenced.

Unclear points

- What genomic efforts/tools are available in entomology? How do NPLs know if scientists were successful in developing genomic tools for entomology?
- Can the Web be used more often to get information out?

Areas in Need

- Some needs are quite broad; more focus may be needed.
- Structural linkages should be formalized with other entities.
- Goal of getting information out should be explored extensively.

Plant Pathogens

Strengths

- NPDN appears to be a big success.
- Has played a major role in bringing plant genomic tools to plant path.

Unclear Points

- The end result for the work of this area of science as well as that for other Knowledge Areas to industry is unclear.

Areas in Need

- The work needs to show some impact to clarify end result of accomplishments to the industry.
- New resistance germplasm is available and moving through the system constantly.
- Portfolio needs to be inclusive of all the plant protection efforts including the efforts of plant breeders.
- Communication of success should be improved; most end-users/scientific community members do not know that USDA was instrumental in early plant pathogen work

Weeds

Strengths

- This area of science is doing a great job given the amount of funding.

Unclear Points

- It is still unclear if weed science is or is not funded adequately.
- A link between goal of soil, air and water and reduced risk should be presented more clearly.
- The presentation on this section captured some key needs and did mention aquatics, however it needs to clarify whether aquatic weed control should be included in this Knowledge Area or not.

Areas in Need

- Need to reinforce the need for resistance management;
- Role of habitat impacted by weeds should be linked to endangered species.
- Resistance linkage to product should be referenced.
- Aquatic weeds management and invasive species may need a weeds science focus and consolidation among KA's
- NRI needs to encourage molecular scientists to submit proposals – currently Weed Scientists are predominantly focused on ecological aspects of weed-crop interactions.

Vertebrates and Mollusks

Strengths

- General strength, visibility, and focus across selected vertebrates and other pests with little available funding.

Unclear Points

- It is unclear if CSREES should even be funding this area being that the Department of Interior and Forest Services are involved; those agencies should likely be the primary funding sources.

Areas in Need

- Overall, this is a very limited program, with primary emphasis on deer.
- Effort needs to be made to expand the program.
- There should be increased focus on birds since these species are a big problem.
- Snails, frogs, rodent control, endangered species etc. should be included in this KA -- rather than strictly focusing on deer.

Biological Control of Pests

Strengths

- This KA did a fairly good job of outlining accomplishments.
- IR-4 was a good example.
- Examples of good publicity were highlighted well.

Areas in Need

- Best practices for biological control of weeds were identified as needed for biological control as a whole but they are not clearly listed in the self-study document.
- Population dynamics of beneficials needs to be a focus of this area of science.
- CSREES and Land Grants should continue to place significant emphasis in this area of science given that, until technologies are proven, the private sector is generally reluctant to attempt development and commercialization.

Integrated Pest Management Systems

Strengths

- This KA shows major effort across disciplines and has highly recognized visible components.
- Suggestions
- It is difficult to track RAMP and CAR individual RFP's. They should be combined and have a single effort coordinating them across the regions.
- Need more focused activities and better articulated expectations to implement across centers.
- IR-4 model for stakeholder involvement is not feasible in Washington, but the IPM centers should follow it even though this kind of movement is costly.
- Stakeholder meetings should be coordinated and done uniformly.

Areas in Need

- CSREES is uniquely positioned, and therefore can and should take a leadership role.
- There needs to be stronger leadership from IPM rather than just being a facilitator.

- There was not much discussion in the self-review report on what is done relative to the centers, but the Panel is aware that IPMs do a fair amount, the Panel suggests that:
- The work of the centers needs to be better publicized.
- Focus of centers needs to be narrowed. Additionally, power should be equally distributed throughout all centers.
- Additional linkages with both the SARE and organic program are needed by CSREES and the centers.
- NPLs need to be more involved to provide guidance, management and direction. There is a lack of information on whether they do this or not.
- Progress reports should be required and reviewed.
- There is a need for greater involvement and more focus on limited- resource-farmers, and greater emphasis on training of front end people.
- There needs to be greater emphasis on training of front end people.
- There is still a need for good communication and involvement at all levels.
- NPLs need to become more proactive with regional associations of AES and CES Directors, and 1890 Deans and Directors.
- NPLs need to meet with them and talk to them about their centers.
- A clear vision --the big picture goal needs to be articulated. This should be done at the national level so that regional/state level centers can have a standard by which to derive and articulate a parallel vision.
- NPLs need to deal better and more quickly with measurement issues.
- The self-study document should present information on accomplishments and needs to be more concise and to-the-point.