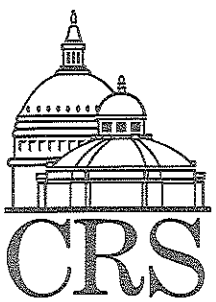
96-221 ENR

CRS Report for Congress

Agricultural Research, Education, and Extension: Questionnaire Responses from Partners and Stakeholders

Jean M. Rawson
Specialist in Agricultural Policy
Environment and Natural Resources Policy Division

March 6, 1996



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Agricultural Research, Education, and Extension: Questionnaire Responses from Partners and Stakeholders

SUMMARY

The public agricultural research, education, and extension system is a vast network of federal agricultural research facilities, land grant colleges of agriculture, state agricultural experiment stations, colleges of veterinary medicine, colleges of forestry, and federal, state, and county Extension offices.

The system, which is largely credited with helping to make U.S. agriculture the most productive in the world, is currently facing some serious challenges from budget constraints at both the federal and state level, from scientific advances that have new implications for the research system and for the U.S. food and fiber system as a whole, and from public demands for progress in such areas as natural resource conservation, environmental protection, food safety, farm worker safety, and rural development.

Since 1977, Congress has enunciated federal agricultural research, education, and extension policy in the context of omnibus legislation covering most major areas of U.S. agricultural policy. However, the bipartisan leadership of the House Agriculture Committee in 1995 stated their interest in conducting a major review of research and extension and in considering policy reforms under separate legislation.

In preparation for this debate, Committee Chairman Pat Roberts solicited responses to a list of questions on a comprehensive range of agricultural research, education and extension policy issues from a wide range of partners within the system and from a variety of stakeholder groups. The questionnaire covered issues related to goals and priority setting mechanisms, research funding options, mechanisms for enhancing competitive grants, the structure and roles of the various components of the system, and tracking and evaluation systems for measuring research progress. This report is a digest of those responses.

The overall picture emerging from the 35 responses is that the system is changing to meet its challenges, but perceptions about the long term implications of some changes are mixed. Secondly, both partners within the system and stakeholder groups have considerable interest in clarifying and establishing principles to guide the evolution of the system into the future. Respondents offered a great number of options to consider under every category -- some that the system itself could consider and choose, and some that could be facilitated by changes in legislative authority and by administrative leadership by the U.S. Department of Agriculture.

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INTRODUCTION[2]

A vast network of federal agricultural research facilities, state agricultural experiment stations, and federal, state, and county Extension offices comprise the public agricultural research and extension system. This system, along with the teaching programs of the land grant colleges of agriculture, colleges of veterinary medicine and colleges of forestry, is largely credited with developing and disseminating the technologies that have helped to make U.S. agriculture the most productive in the world.

Nonetheless, the system is currently facing serious challenges from budget constraints at both the federal and state level, from scientific advances that have new implications for the research and extension system as well as for the U.S. food and fiber system as a whole, and from public demands for progress in such areas as natural resource conservation, environmental protection, food safety, farm worker safety, and rural development.

Federal research and extension policies strongly affect the system's ability to meet these challenges. Since 1977, Congress has enunciated federal agricultural research, education, and extension policy in the context of omnibus legislation covering most major areas of U.S. agricultural policy. However, the bipartisan leadership of the House Agriculture Committee in 1995 stated their interest in conducting a major review of research and extension and in considering policy reforms under separate legislation.

In preparation for the debate, Representative Pat Roberts, Chairman of the House Agriculture Committee, issued a list of questions on a comprehensive range of agricultural research, education and extension policy issues in July 1995. The questions cover ten policy areas: the role of the federal government in agricultural research, priority setting mechanisms, advisory boards, funding

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[1] The complete list of questions is in Appendix A of this report. Also, the full text of the questions and responses was published by the House Committee on Agriculture as an unnumbered Committee Print. See, "Compilation of Agricultural Research, Education, and Extension Questions for Discussion," Committee on Agriculture, U.S. House of Representatives, December 1995.

[2] Professional staff of the House Committee on Agriculture prepared a summary of the questionnaire responses for internal use by the Committee. Parts of it are used in this report by permission of the Committee staff.

mechanisms, dissemination of research results and the role of the Extension Service, structure and role of the land grant Colleges of Agriculture, structure and role of federal agriculture research laboratories, competitive grants, research tracking and evaluation, and international research programs.

A number of researchers and administrators at universities and policy analysts with various stakeholder groups prepared written responses to the questions. At the request of the Committee, CRS synthesized and summarized the responses. The respondents are listed below.

American Association for the Advancement of Science--Section on Agriculture (AAAS)
American Feed Industry Association (AFIA)
American Institute of Biological Sciences (AIBS)
American Oat Association
American Phytopathological Society (APS)
American Society of Agricultural Engineers (ASAE)
American Society of Agronomy/Crop Science Society of America/Soil Science Society of America (ASA/CSSA/SSSA)
American Society of Plant Physiologists (ASPP)
Association of American Veterinary Medical Colleges (AAVMC)
Association of Research Directors, Inc. (1890s)
Center for Rural Affairs (CRA)
Coalition on Funding Agricultural Research Missions (CoFARM)
Council for Agricultural Science and Technology (CAST)
Council of Scientific Society Presidents (CSSP)
Council on Food, Agricultural, and Resource Economics (C-FARE)
James H. Denton, University of Arkansas
Entomological Society of America (ESA)
Mary Anne Higgins, Indiana University-Purdue University Fort Wayne
Institute of Food Technologists (IFT)
National Association of State Universities and Land Grant Colleges--Board on Human Sciences (NASULGC/BHS)
NASULGC--Extension Committee on Organization and Policy (ECOP)
Northeastern Regional Association of State Agricultural Experiment Station Directors (NERA)
North Central Association of Agricultural Experiment Station Directors (NCRA)
Poultry Science Association, Inc.
Reavis Farms, Inc.
Society of Nematologists
Soil Science Society of America
Southern Association of Agricultural Experiment Station Directors
SUSTAIN (Sharing U.S. Technology to Aid in the Improvement of Nutrition)
Luther Tweeten
U.S. Department of Agriculture (USDA)
Henry A. Wallace Institute for Alternative Agriculture
Western Association of Agricultural Experiment Station Directors
World Bank (Agricultural Research)

DIGEST OF RESPONSES

The following synthesis of responses reveals some areas of consensus, as well as some areas of long-standing difference of opinion. In the interest of readability, majority or consensus opinions frequently are presented simply as statements, whereas opinions held by less than a majority are so identified. These responses do not represent positions of the Congressional Research Service.

THE ROLE OF THE FEDERAL GOVERNMENT IN AGRICULTURAL RESEARCH AND EXTENSION

The primary role of federal government in agricultural research is to support basic and applied research on issues of national and regional importance. The emphasis should be on basic research that is long term, high risk, and focused on areas of both basic and applied research where the private sector has little or no incentive to invest.

The federal government should provide leadership in coordinating with state and private industry partners to set goals and to keep the research vision forward-looking and focused on areas with high social payoff.

The federal government should provide funding to help maintain the infrastructure for research and agricultural education, and should provide base funding for state research.

A portion of the savings from reductions in federal commodity price and income support programs should go to expand competitive agricultural research grants.

Mechanisms exist at the federal level for coordinating USDA research with research being done in other federal agencies, but there is room for improvement. Respondents gave mixed reviews on the effectiveness of the National Science and Technology Council, with some saying it could work, given the time and resources, and others saying that agricultural research was grossly under-represented in the Council's activities and that the NSTC has not included land grant universities, colleges, or experiment stations in its coordinating process. USDA stated that it has been an active player in the NSTC process.

USDA stated that the role of federally supported research is to (1) enhance economic opportunity for rural people and farmers; (2) support a healthier, better-educated citizenry; (3) reduce risk for consumers and farmers; (4) enhance global competitiveness; and (5) protect the natural resource base for society. The Department also stated that federal funding should give way to private investment as new knowledge and technologies approach the marketplace.

Roles for USDA Research, Education, and Extension (REE) Agencies

The Cooperative State Research, Education and Extension Service (CSREES) should continue and its role as a liaison between USDA and the State Agricultural Experiment Stations (SAES), and improve that role by fostering linkages among all partners, including ARS, other federal agencies, industry, the Congress, the Administration, etc.

CSREES could play a greater role as an intermediary, integrator, and even contract broker in cooperative research ventures between the State Agricultural Experiment Stations (SAES) and USDA and non-USDA action agencies, and between SAES and private industry. Some respondents stated that ARS should be primarily responsible for supporting USDA action agencies and the agriculture-related agendas of other federal agencies; one response stated that USDA should not perform research in support of non-USDA agencies as that would be a conflict of interest.

The USDA REE agencies should seek new partnerships with constituent groups representing emerging societal concerns about natural resource use, rural development, food safety, animal wellbeing and other issues.

USDA stated that its proposal to create a Research, Education, and Economics Policy Council within the Under Secretary's office will help the REE agencies improve the management and delivery of agricultural research.

PRIORITY SETTING

Overall, the priority setting process was judged to work reasonably well but could be improved, mostly through involving a greater number of stakeholders -- including food and agricultural industries, consumers, environmental interests, economists and other social scientists, and public health and food safety interests. There should be more local, state, and regional input into the priority setting process. Priority setting should be more focused and forward-looking, and better linked with funding allocation and research planning.

The priority setting process used in the Food Animal Integrated Research for 1995 (FAIR '95) conference would have merit as a model for the U.S. agricultural research system as a whole if the list of stakeholders involved were expanded. Some respondents saw drawbacks to the FAIR '95 model, stating that it might have limited usefulness as a planning guide for scientists or funding agencies, that it might be inadequate for setting goals for basic research, and that it is not necessarily an improvement over the current process but has been useful as a contributor to it. USDA commented that the model would not take into account the needs of the Department's action agencies.

Several groups identified other existing priority setting mechanisms as models for consideration:

- The Experiment Station Committee on Organization and Policy's (ESCOP) strategic agenda process,
- the Agricultural Research Service program plan,
- the National Research Initiative (NRI) advisory committee, and
- the Plant and Soil Science Forum.

Other specific suggestions to improve research priority setting and implementation were:

- Hold congressional oversight hearings of the Government Performance and Results Act (GPRA) and other relevant laws.

- Establish a process that would update state, regional, and national research needs every 3 to 5 years.

- Detach research and extension policy from the farm bill and make it permanent law.

- Establish an Internet home page to solicit input in research needs and priorities from grassroots organizations.

- Require the Experiment Stations to announce a ranked list of specific institutional research priorities as a condition for receiving federal funds.

Several respondents offered their opinion on specific research areas that they felt should receive higher priority:

- Rural economics and social issues,
- animal wellbeing,
- new uses for agricultural commodities,
- long term sustainable agriculture,
- farm worker issues,
- issues of concern to small and midsize farmers, and
- nutrition.

Responses were mixed on the question of whether federally funded research should address specific technological and industrial needs. Some felt that it should, but only when justifiable in terms of national interest. Others stated that it should not, but that industry should be involved in the research planning process, to provide a feedback loop. Several respondents commented that public/private research integration is occurring naturally as public funds diminish, and that models already exist for how to define the role of each partner -- e.g., the Solutions to Environment and Economic Problems (STEEP) program in the Pacific Northwest, the Midwest Plant Biology Consortium, and the Germplasm Evaluation in Maize (GEM) program. Both pro and con

respondents stressed that technology transfer could be improved if industry and Extension were involved earlier in the research planning process.

Several respondents maintained that there should be (1) less emphasis on production agriculture as a discrete research area apart from broader social goals, such as environmental protection and food safety, or (2) a better balance between production research and emerging issues. A majority agreed that more multidisciplinary research on integrated systems (e.g., water quality, integrated pest management, sustainable agriculture, integrated resource management) should be done in the future, that farmers and private sector representatives should be included in integrated research planning, and that the Extension Service should take a national leadership role in this area.

ADVISORY BOARDS

Opinion was about equally divided, pro and con, on the effectiveness of USDA's several existing research and extension advisory boards. A majority of respondents stated that fewer boards would be better -- some suggested one or two -- and that such boards could accommodate all stakeholders including related agencies, scientists, consumers, administrators, industry, farmers, and local communities. Several respondents specifically stated that ARS should become a full partner on advisory boards. Some expressed the opinion that advisory boards are more useful at the regional or local level, where their goals can be more specific.

One respondent suggested that long range planning should be based on a list prepared by top scientists of significant, unanswered research questions.

Another respondent proposed that state agricultural experiment stations be required to announce publicly a ranked list of specific institutional research priorities before receiving federal funds under any authority. The purpose would be (1) to provide an incentive for institutions to identify research priorities systematically, (2) give researchers clear institutional goals to work toward (in addition to peer recognition and grant awards), and (3) make the institution's work more visible to interested members of the public.

USDA's response cited its earlier farm bill proposal to replace the Joint Council on Food and Agricultural Sciences, the National Agricultural Research and Extension User's Advisory Board, and the Agricultural Science and Technology Review Board with one National Research, Education, and Economics Advisory Committee (having four regional advisory subcommittees). Second, USDA has proposed to base REE research prioritizing and planning on outcomes rather than on broad disciplinary areas. Third, USDA stated that the priority setting process would be improved if a 10-year strategic plan were established for publicly funded agricultural research facilities. Finally, USDA also views the Government Performance and Results Act as an opportunity to improve the priority setting process.

There was general support for some connection between the advisory board process and international agriculture, but few specific recommendations and little consensus. Some advised creating a separate board to prioritize international research needs, while others said that the domestic advisory boards should have members or observers who are knowledgeable about international agriculture, or simply should be aware of global agricultural and social issues. A few expressed the opinion that the advisory boards had little role to play concerning international agriculture, or that the international community would be best served if the Nation took care of its domestic agricultural needs first.

USDA stated that the National Agricultural Research, Education, and Economics Advisory Board could elect to establish a subcommittee or task force to focus on the international dimension of research and extension planning.

FUNDING MECHANISMS[3]

The general view was that direct funds, formula funds, and competitive grants are all appropriate funding mechanisms and should be retained as the means of distributing federal dollars among research partners. There was no consensus on the relative share of the total research portfolio that each mechanism should have, but a majority stated that formula funds and competitive grant funds should be increased.

Of the respondents who registered opinions about earmarked special research grants, about equal numbers argued for and against keeping them as a funding mechanism. Those who argued in favor of them premised their support on special grant funds being awarded competitively. Those who argued for their elimination were reacting to the fact that most special grants are earmarked and are not reviewed for scientific merit or applicability to national priorities. Supporters of competitively awarded special grants stated that they should represent 5-20 percent of USDA's research portfolio. Some stated that special grant funds should be pooled with the formula funds.

A majority of respondents stated that federal funds should support both research programs and research facilities, with some qualifications. These included requiring matching funds, awarding funds for facilities competitively,

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[3] Federal funds for agricultural research currently are distributed by four means: by direct appropriation; by formulas spelled out in various acts; by grants awarded by a competitive peer-review process; and by grants specified by congressional appropriators (called special grants). If these different mechanisms were viewed as an investment portfolio, the Department's largest investment would be in direct funding to its in-house research agencies, ARS, the Economic Research Service (ERS) and the National Agricultural Statistics Service (NASS). Its next largest investment (slightly more than half the size of the in-house investment) would be the formula funds that support research at the State Agricultural Experiment Stations. Next in the portfolio would be the National Research Initiative Competitive Grants Program (NRICGP), at 11 percent of the size of the in-house investment. Last would be the Special Research Grants program, representing just under 6 percent of the in-house investment.

targeting federal support only to facilities that relate to national or regional priorities. USDA has proposed a competitive grant program for university research facilities.

Several respondents commented that the public agricultural research system has significant need for federal assistance in purchasing scientific equipment.

All respondents supported the continued use of formulas as a means for distributing a portion of the total annual appropriation for agricultural research and extension. However, a majority made suggestions for changing them. Three respondents stressed the importance of thoroughly studying the potential impact before any changes are made; one noted that the harm to the collegiality of the research and extension system could outweigh any benefits from changing the formulas. The changes suggested were:

- Review and update formulas every 5 to 10 years.
- Disburse formula funds according to research priorities.
- Make funding available to all research organizations.
- Add factors such as value of farm marketings in each state, urban demographics, acres in production, cash value of crops and livestock, natural resource protection, regional research needs.

One respondent proposed placing a cap on the formula funds going to each experiment station. The cap would go into effect only when the station received more than a specified share of its funding from sources other than formula funds.

Another respondent suggested that agricultural research should be funded at a percentage of the Gross National Product (GNP) at a level consistent with major trading partners, and that emphasis should be put on biotechnology research.

Respondents registered a wide range of opinion on the question of whether commodity check-off fees would be an appropriate source of additional funds for research and extension. The majority commented that check-off funds currently are useful in bringing the results of state-level, short term research on line faster. However, many respondents pointed to an emerging trend among Research Promotion Boards to use check-off fees to support more long term, mission-oriented research focused on commodity-wide issues (e.g., plant genome mapping). USDA commented that this trend should be encouraged. On the other hand, two respondents were concerned that check-off funds could be perceived as a substitute for funding from state and federal sources, and could hurt public support for research in the long term.

DISSEMINATION OF RESEARCH RESULTS: USDA'S ROLE, LEGISLATIVE OPTIONS

Responses to questions about what USDA and the Congress could do to improve the management and delivery of agricultural research revealed a general perception that improving the interaction among -- and the information available to -- federal/state research and extension partners would greatly improve USDA's ability to manage and deliver research, and that current advances in computer technology and electronic communications should facilitate progress in this area. USDA and other respondents stated that the 1994 reorganization of the Department's REE agencies will also enhance research delivery in the long run. In addition, respondents offered many specific suggestions, summarized below:

USDA should:

- Streamline research administration through development of a state-of-the-art management information system covering federal and state partners, USDA and non-USDA agencies, and Extension.
- Foster a common multidisciplinary, inter-institutional approach to research, teaching and extension.
- Integrate the work of the Economic Research Service (ERS) with ARS and experiment station projects; reward ARS and ERS for dissemination of information to customers.
- Use electronic technologies to make science-based information widely available.
- Shrink USDA bureaucracy; avoid over-bureaucratization of Government Performance and Results Act (GPRA) process.
- Seek an exemption for USDA REE agencies from the federal Advisory Committee Act (FACA); increase university involvement at federal level by using the Intergovernmental Personnel Act (IPA) to bring state personnel to USDA for short periods.
- Move ARS scientists into or closer to universities.
- Seek legislative support for the flexibility to reassign appropriated funds to priority issues.
- Encourage CSREES to establish cooperative research and development agreements (CRADAs) with industry.
- Subject ARS research proposals to a peer review process comparable to that of the NRI.

Legislative options are:

- Authorize the development of an electronic management information system.
- Provide more funding for competitive grants.
- Revise legislation pertaining to intellectual property rights and technology transfer in order to streamline these processes and spur private research.
- Exempt research advisory committees from FACA
- Create a mechanism to reward high quality multi-institutional research, teaching, and extension programs.
- Authorize the Secretary to reassign funds to priority research issues.
- Provide oversight on GPRA process so that it does not become a bureaucratic burden on the scientific community.
- Continue support for programs like the Small Business Innovation Research Program and the Alternative Agricultural Research and Commercialization Center that focus on putting research results to use.
- Continue to work for the harmonization of international standards.

Several respondents also noted that publication of research results in peer reviewed journals is a highly productive means of disseminating research results.

Concerning the question on the federal role in agricultural education, a majority of respondents stated that the most important federal role is to support the land grant college system and increase support for graduate training through grants and fellowships. Several respondents expressed support for expanding agricultural education at the kindergarten through undergraduate college levels.

THE ROLE OF THE COOPERATIVE EXTENSION SYSTEM

The majority of respondents stated that Extension has been an effective institution and still is effective in some areas, but that rapid change in the structure of agriculture and in science and technology call for a reexamination of its role. Several respondents noted that Extension could be more effective in its program delivery if it used new communications technologies to give county agents better access to in-depth knowledge and to reach diverse constituencies. One respondent argued in favor of deemphasizing county-based activities and developing regional Extension programs.

Concerning Extension's role in production agriculture, a number of respondents suggested that Extension should provide continuing technical education to private sector agricultural consultants and devote its direct public education programs to areas related to the "public good," e.g., multidisciplinary programs on water quality, integrated pest management, and other areas where there is no incentive for private industry to become involved. Some respondents made similar responses with a wider perspective, suggesting that the future role for Extension personnel might be as organizers, facilitators, information brokers and networkers rather than direct transferrers of information.

On the issue of Extension's role in teaching research-based information, several respondents stated the need for full reintegration of research and extension functions: Extension should use ARS as well as experiment station research to underpin its programs, and should be involved from the outset in public and public/private cooperative research planning. Extension also should play a pivotal role in disseminating the results of research on integrated farming systems.

A majority of respondents stated that it is appropriate for Extension to offer programs to meet urban and rural social needs, as long as they are related to university research.

THE STRUCTURE AND ROLE OF THE LAND GRANT COLLEGES OF AGRICULTURE

Respondents expressed a consensus that the current and traditional role of the land grant colleges of agriculture (LGCs) should continue. Collaboration and partnership with the 1890 and 1994 schools should be increased.

It was widely held that it should be the states' prerogative to determine the advisability of merging federal and state or adjoining state research facilities; leadership and funding mechanisms that encourage interstate collaboration are the proper federal role in this area. Most respondents were in favor of increased regional or interstate collaboration; however, on the question of merging facilities, roughly an equal number of respondents opposed it as favored it. Opponents cited as reasons the loss of research support for the teaching function, and the loss of site-specificity of research for local benefit.

Appropriate mechanisms already exist to coordinate regional agricultural research. The process could be helped by (1) formulating a national strategic plan that included all research partners, public and private; (2) using electronic communications; (3) appointing a joint commission to review federal and state research facilities. Models for improving regional coordination are: Hatch Act regional research projects, the STEEP program in the Pacific Northwest, the Management Systems Evaluation Area project, the Center for Agricultural Impacts on Water Quality, and the Rural Retailing project that grew out of a North Central regional research project.

The majority of respondents agreed that it is appropriate to use federal funds to promote cooperative regional research and to encourage multistate centers of excellence. Several made cautionary remarks about regional centers of excellence:

- Oversight is needed to avoid free-rider problems.
- Centers should be "paper" centers, not physical buildings, in order to avoid over-institutionalization and inflexibility.
- There needs to be a mechanism to ensure that each state involved takes an equal share of financial responsibilities.
- A center of excellence should be created only if it fills a regional void.

THE STRUCTURE AND ROLE OF THE AGRICULTURAL RESEARCH SERVICE

The majority of respondents stated that ARS successfully fulfills its mission to do basic and applied research in areas of nationwide or regional interest, and that ARS laboratories that perform that function should be maintained. However, the majority also expressed strong support for more co-location of ARS laboratories on university campuses (or with private institutions). Several respondents argued in favor of closing or consolidating smaller ARS labs in remote locations. USDA stated that some relatively isolated locations in the Great Plains region are necessary because many of the universities in that region are located on the edges of the region in more densely populated cities.

Several respondents called for joint strategic research planning between ARS and the SAES, and streamlining ARS cooperative agreements to facilitate joint projects and remove disincentives. It also was suggested that authority be given for formal joint ARS/LGC appointments, and that on-campus ARS scientists become involved in graduate teaching programs and Extension. One respondent specifically recommended that ARS projects in plant sciences, biotechnology, and human nutrition be co-located on 1890 land grant colleges campuses.

In response to a question asking whether a portion of ARS funding should be redirected into competitive grants to the broader agricultural research community, several respondents expressed support for the idea. One suggested that ARS funding be shifted entirely to competitive grants over a 5-year period, that ARS change to a university-style promotion and tenure system, and that ARS scientists be required to take sabbatic leaves to university laboratories. Several other respondents stated that ARS programs should be peer reviewed by outside panels.

USDA responded that it supported both the in-house research function provided by ARS *and* competitive grants. It did not advocate redirecting a portion of ARS funding to competitive grants, but rather, redirecting earmarked research and facility grants to that purpose.

THE NATIONAL RESEARCH INITIATIVE (NRI) COMPETITIVE GRANTS PROGRAM

Answers to the question on where in the agriculture budget money could be found to fully fund the NRI are as follows:

- Transfer funds from: the Commodity Credit Corporation; consolidation or closure of ARS laboratories; all USDA research agencies; other Executive Branch agencies; the Special Grants program; earmarked facilities grants; savings from cuts in food assistance and conservation programs.
- Create an industry/commodity group endowment from check-off fees.
- Alter NRI authorizing language to support program goals through both direct funding and competitive grants.
- Give a tax deduction to private businesses that contribute to an NRI trust fund.
- Solicit a $1 per year contribution from taxpayers (through the Internal Revenue Service) for national security.
- Set an equal minimum discretionary funding level per ARS and land grant scientist and award the balance of the research budget competitively.
- Require matching funds from commodity groups.
- Review intellectual property rights laws to provide incentives to scientists for work that results in economic development. (Related suggestion: Require NRI proposals to include a plan for the dissemination of research results).
- Improve multi-year funding of NRI research projects.

Some respondents are opposed to taking money from existing research programs, particularly from formula funds, to fund the NRI. They argue that enhancing formula funded programs would result in more flexibility to shift priorities, while also maintaining emergency response capabilities.

One respondent suggested adopting an NIH-style, two-tiered grant review process to help ensure that the grants awarded support the program's goals. A scientific peer review panel would first identify research proposals having the highest scientific merit. A second review panel that includes both scientists and interested members of the public would then judge how well those proposals meet institutional goals and priorities.

Several respondents voiced the following criticisms of competitive grants:

- Good proposals go unfunded due to high competition for insufficient funds.
- The funding ceiling per grant is too low for multidisciplinary research.
- NRI grants are skewed to academic departments that have large numbers of full-time employees, not to the utility of the research.
- If too much money is awarded competitively it squelches innovative or new investigators.
- Writing grant proposals takes too much time away from doing research.
- Protocols (such as for sustainable agriculture) should not be used to pre-screen NRI proposals.

RESEARCH TRACKING AND EVALUATION

Answers to a question on the usefulness of the Current Research Information System (CRIS, a computer system for tracking research projects) varied greatly by type of respondent. Academics tended to find CRIS useful although several had suggestions for improvement. These were:

- Replace current CRIS categories with categories reflecting social goals; require researchers to report projects by social goal rather than by subject matter or discipline; report allocation of funds by revised categories.
- Modernize or replace CRIS with a computerized Management Information System (MIS).
- An MIS should include separate systems for tracking research and Extension projects, but be jointly planned, linked, and referenced. (Related suggestion: Also include the National Science Foundation, the Environmental Protection Agency, the National Institutes of Health, etc.).
- A new MIS system should include research outcomes and be a user-friendly, electronically searchable database for informing the general public and the media.
- Make sure that the research reporting requirements of any new system are flexible enough to reflect state and regional differences and do not result in a bureaucratic overload on scientists.

- Coordinate implementation of the Government Performance and Results Act with the development of a new MIS to avoid duplication and excessive bureaucracy.

On the subject of research evaluation, a number of respondents stated that all federally supported research should be peer reviewed, either by outside panels or through publication in peer reviewed journals.

INTERNATIONAL RESEARCH AND EXTENSION PROGRAMS

The land grant academic community traditionally has been a significant source of expertise for agricultural development projects in Third World nations. The U.S. Agency for International Development (USAID) has been a primary source of funding for these projects, but has reduced its activities in this area in recent years.

Respondents expressed cautious support for USDA's playing an expanded role in promoting agricultural progress in developing countries to help fill the gap left by the change in USAID policy. There was widespread acknowledgement of the need to avoid the conflict inherent in USDA's promoting foreign agricultural development at the same time as it promotes the export of U.S. commodities.

Response to the idea of USAID's contracting directly with USDA/REE agencies for development activities was very mixed; about equal numbers were against it as were for it, and several commented that the implications were uncertain. USDA stated that USAID has already contracted directly with USDA/REE for some agricultural research activities, and that more such joint projects would be beneficial.

Respondents suggested that USDA should:

- Work to establish new legislative authorities on international research to promote cooperative projects in genome mapping, precommercial research with major U.S. trading partners, and otherwise support the emergence of a global research system.

- Promote the Global Research on the Environmental and Agricultural Nexus for the 21st Century (GREAN) proposal as a model for international research and development in the post-Cold War era.

- Support continued funding through USAID for the International Research Centers and the collaborative research support programs.

- Work to depoliticize international issues such as environmental quality, trade, transportation, and human health.

- Become involved in international food security issues and help develop mechanisms for addressing food security "hot spots."

- Increase U.S. research emphasis on food processing, nutrient fortification, preservation and delivery, all of which address major factors in global hunger problems.

- Increase linkages with USAID/LGC development projects.

- Include the international dimension in planning federal/state cooperative research and Extension programs.

- Develop a formal program to train U.S. agricultural students in foreign locations, and to strengthen the LGC's international programs. (Related suggestion: Increase collaborative research with highly reputed foreign scientists; support scientist and student exchanges).

- Sign memoranda of understanding (MOUs) or CRADAs with other governments for joint projects where commonalities exist in soil types, weather, vegetation, etc.; choose countries where the United States has a comparative advantage, or countries that grow commodities that the United States cannot.

- Facilitate international germplasm exchange for research.

- Assist U.S. firms in international marketing with research-based information; enlist Extension's assistance in this area.

- Explore partnership with the private sector on international activities.

APPENDIX A

AGRICULTURAL RESEARCH, EDUCATION, & EXTENSION QUESTIONS FOR DISCUSSION

Federal agriculture research goals

1. What should be the role of the federal government in agricultural research?

2. To what extent should goal setting and goals in agricultural research be cognizant of and coordinated with research activities in the rest of the federal research sector (HHS, EPA, DOE, etc.)?

3. Is the process associated with the Food Animal Integrated Research for 1995 (FAIR '95) adequate for the development of federal agriculture research goals? Are there goal identification processes which might better serve to enhance federal agricultural research other than FAIR '95?

4. If the process of FAIR '95 were to be used to adopt an agenda for federal agricultural research, how would the goals identified in FAIR '95 (listed below) need to be modified to address the concerns of all research stakeholders?

    1) Enhance industrywide responsiveness to consumer and societal concerns;
    2) Meet market demands through increased efficiency and competitiveness;
    3) Develop integrated food animal management systems;
    4) Maintain and enhance environmental quality;
    5) Improve food quality control in terms of safety, desirability, and nutritional composition; and
    6) Enhance animal well-being throughout the life cycle of food-producing animals.

Priority setting

5. Is federally funded agricultural research focused on the issues of highest priority for producers, processors, and consumers? If not, how can the priority setting mechanism be improved to insure that these issues are addressed?

6. Should federally funded agricultural research address specific technological and industrial needs? If yes, does the present system fulfill this goal (if not, please describe how this can best be accomplished)?

7. Does federal agricultural research adequately address projects that result in quantum leaps in benefits, or does it dwell too much on incremental benefits?

8. What is the appropriate role for USDA/REE in insuring competitiveness in the face of decreases in price support programs?

9. How can the appropriate federal-state-industry resource pools be integrated to develop high priority regional programs in research, teaching, and extension?

10. How important is the federal agricultural research role in supporting other agencies of USDA? Of other federal agencies? Could this be done more efficiently and at lower cost?

11. USDA reorganization created the Cooperative State Research, Extension, and Education Service (CSREES). In your opinion, how should this newly configured agency function to support the U.S. agricultural enterprise, 1995-2002?

12. What is the proper place for integrated systems programs? What role should the Extension Service (extension functions within CSREES) play in these programs?

Advisory boards

13. Have USDA's research and extension advisory and coordinating boards been effective in planning and prioritizing agricultural research and extension? (please explain)

14. How have research or extension priorities been changed as a result of the recommendations of advisory boards? (please provide examples) Are there presently too many advisory boards?

15. What options should Congress consider to improve USDA's process for planning and prioritizing agricultural research? (i.e. how should the research agenda be prioritized?)

16. What role should stakeholder advisory boards play in setting the agenda? What groupings should be represented on advisory boards? Can "customers" and "partners" be accommodated on one board or will it require two?

17. Is there a special role for advisory boards to play in international agriculture beyond what has occurred in the past?

Funding considerations

18. What is the most appropriate mix of federally funded basic and applied agricultural research?

19. How, if at all, can the effectiveness and efficiency of agricultural research be enhanced at current funding levels? At reduced funding levels?

20. How can future funding be determined and justified so as to permit multi-year programs to be completed?

21. In view of the growing emphasis on greater accountability of federal expenditures, do you have any suggestions as to how agricultural research results can be measured and their impact evaluated? Is there some standard of accountability for the efficient and effective use of federal research funds?

22. What is the proper balance between in-house, formula funds, competitive grants, and special grants?

23. What guidelines should be used in determining appropriations for "specified programs' in research, education, and extension?

24. Should federal funds be used for programs only, or for facilities as well? If for facilities, how should they be allotted -- competitive proposals or other? Is there a place for regionalizing research, increasing competitive grants, etc.?

25. Is there a place for partnerships not only with state and local public sector organizations and industry; but also with private foundations?

26. To what extent do self-assessed "check-off" fees on commodities provide resources for research and education? Do these/should these programs support long-term research, as opposed to short-term product development and promotion research?

Delivering agricultural research

27. In order of priority, what would be the most significant actions USDA could take to improve its management and/or delivery of agricultural research?

28. What options should Congress consider to improve the delivery, results, and benefits of federally funded agricultural research?

29. What should be the federal role in insuring training of future work forces for the food and fiber needs as well as the natural resource concerns of the public?

Land grant universities

30. What is the continuing role of land grant universities? 1890 colleges? 1994 colleges?

31. Is the current formula used for allocating federal funds to land grant universities fair, reasonable, and does it address changing conditions? If not, how could it be improved?

32. The land grant universities have a system of agricultural experiment stations in each state. In today's environment of federal and state fiscal constraints, is such an extensive system of research stations still warranted? (please explain) Could certain functions be merged with other USDA agencies, other federal agencies, etc.?

33. How can agriculture research be best coordinated among federal, state, and private institutions?

34. What models currently exist, and are in use to provide regional cooperation in research and extension?

35. In the current era of constrained resources, is it appropriate to use federal funds to promote cooperative regional research to reduce unnecessary duplication; and to what extent is it appropriate to use federal funds to encourage consortia of states to establish individual centers of excellence to address common problems?

36. As societal concerns about natural resource use, rural development, animal well being, etc. are integrated into the USDA agenda, is there a role for "new" partnerships with the federal sector?

37. Other parts of the federal government sponsor research directly applicable to the food and agriculture system. The National Science and Technology Council is intended to address the coordination of related activities across agencies. How is this intended to work in the case of research and extension on food and agriculture? How well is it actually working? Are alternative methods needed?

National Research Initiative

38. Congress authorized the National Research Initiative (NRI) Competitive Grants Program at $500 million per year. If the NRI is to be fully funded, where in the USDA research budget could money be transferred from?

39. What other options for funding the NRI should Congress consider?

40. Have NRI appropriations been used to expand agricultural research or have they been used to continue existing programs?

Agricultural Research Service (ARS) laboratories

41. Should the USDA have research laboratories or should it provide competitive funding to existing entities such as universities?

42. Should more ARS laboratories be co-located at land grant universities? What should be the relationship between ARS and land grant university scientists? Between ARS research coordination? How can ARS laboratory

functions be more effectively linked to state agricultural experiment stations?

43. Are ARS laboratory facilities effectively used in performing needed research? If not, please explain and offer suggestions for better use?

Extension Service (Extension functions within CSREES)

44. The USDA Extension Service's (ES) mission is, among other things, to disseminate research results to farmers and other customers. In your opinion, is the ES effective in carrying out this mission? (please explain)

45. Should the ES be involved in addressing the problems and challenges confronting urban populations?

46. What if any role should ES play in dealing with the social issues facing farmers and rural communities?

47. Should the ES's mission statement be changed to focus activities on production agriculture?

48. What should ES not be involved in?

Dissemination of research results

49. Do you have any suggestions on how USDA's dissemination of federal agricultural research results can be improved?

50. Who is, or will be, responsible for developing a marketing plan for agriculture and its science and education programs to the American people?

Current Research Information System (CRIS)

51. ARS uses CRIS to provide information about USDA research projects. How, if at all, do you use CRIS?

52. In your opinion, is CRIS effective in helping you obtain information on federal agricultural research projects? If not, what changes are needed to this information system that would provide quality data on federal and State agricultural research? (please explain)

53. Is there/should there be an appropriate and adequate management information system(s) in place to report and collate results from federal investments in research, extension, and higher education sponsored by the USDA (and related research agencies)?

54. Does the CRIS system and other USDA reporting systems provide an adequate accounting of the research and extension work that is being done in America?

International relations

55. How can the USDA be most effective in the short and long term through its support of international activities?

56. Currently, USAID and other programs extend agriculture and agricultural development beyond the nation's borders. What continued or expanded role should USDA play in international research, education, and extension?

57. What is the role of USAID in funding agricultural research and extension? Has USAID maintained support for agriculture or has the agency moved away from agriculturally related programs? What is the role of long-term agriculture R&D in developing countries in developing new markets for U.S. products? Should USAID contract through USDA/REE for long-term agriculture R&D?