

Conclusion

Our review of intra- and extramural public agricultural research, and the interaction of trends in public funding, leads to several conclusions. Policy recommendations from the National Academy of Sciences and the National Research Council (see chapter, “Recent Institutional Changes and Trends in Funding,” p.13) in general argued for increasing fundamental research and associated increasing competitive grants funding with the proposed shift of the public portfolio toward more basic research. Despite these policy positions, applied research appears to have received increased attention in the public agricultural research portfolio. Since developmental funding also grew over this period, the increased emphasis on applied public research meant decreased emphasis on basic public research.

Aggregating the data presented in figures 8-13 and 16-18 demonstrates that, as proposals for increasing competitive grants funding have suggested, a higher proportion of competitive grants funding in the mid-2000s was directed to basic research than was the case for either formula funding or special grants. Nonetheless, the percentage of competitive grants funding allocated to basic research fell from 76 percent to 65 percent between 1998 and 2003. The percentage of formula funding devoted to basic research was about 40 percent over that period. The special-grant basic-research percentage was about 30 percent. Combined with the overall shift in the CSREES-administered portfolio from formula funding to competitive grants and special grants, the combined percentage of basic research in this portfolio stayed under 50 percent (fig. 19). This aggregate reduction in the proportion of basic research was reflected in an aggregate reduction in the basic research proportion for the majority of the topic areas, including the topics with the largest budgets—plant sciences, animal sciences, natural resources and the environment, and human nutrition and food safety.

At the same time, as traditional USDA and State sources of research funding to the SAES diminished, the SAES maintained or even increased real funding by tapping both industry and non-USDA Federal sources. These changes may have had an impact on the total public agricultural research balance between basic and applied research, although this is not directly observable in the data used here. The evidence presented above suggests that private funding tends to be directed more toward applied research, and other Federal funding toward basic research.

As we have noted, the decentralized State-led structure of the system has tended to promote geographically specific applied research. The proponents of Federal intramural research funding usually stress basic research, research of national interest, a coordinating role for Federal agricultural research in general, and the encouragement of interstate research spillovers. Thus Federal research could be viewed as complementary to the applied research that individual State institutions and the private sector were likely to pursue. However, we found no evidence to suggest that Federal intramural agricultural research has become more basic to balance out some of the apparent shifts toward applied research at the State level.

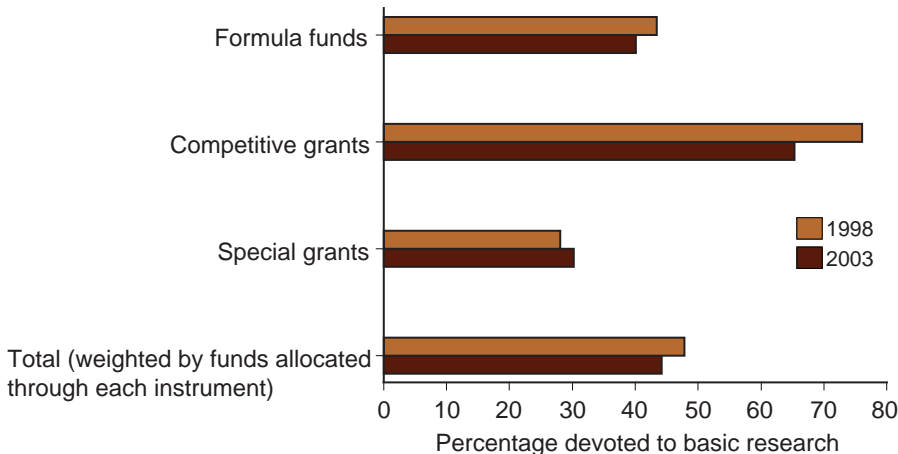
Public policy advice has continued to stress the themes of increasing the proportion of basic public research and the use of competitive funding mechanisms. Despite these prescriptions, we found little evidence for actual increases in the percentages of public research expenditures devoted to basic agricultural research. Several propositions suggest that achieving the optimal amount of basic agricultural research and optimal use of competitive funding mechanisms will be more likely if the nature and history of agricultural research are taken into account:

1. Despite agreement on the importance of basic agricultural research and the advances in science applicable to agriculture, State legislatures might be more likely to appropriate funds to research that they believe will benefit their State. To the extent that the same problems are shown to have national significance, as is more commonly the case, then the chances for State funding only go up. As a result, changes in funding mechanisms or institutional design may meet with greater success if they recognize local aspects of research and demonstrate how more centralized or more basic research might lead to research solutions at the local level.
2. Although the history of other major Federal research investments, particularly at NIH, implies that competitive funding can be associated with more basic research, recent history suggests that this effect in agricultural research is more modest and can change over time. Thus, proposals for competitive funding as a tool to promote basic research might be more likely to meet their goals if additional mechanisms—such as explicit guidelines for the nature of peer review and for focus on issues of basic science—are added to the competitive design.

Changes in funding emphasis described in this report indicate that many successful agricultural scientists must be able to adapt their subject areas and research approaches to respond to new funding opportunities. The situation in public agricultural research in recent years has been one in which funding for basic agricultural science from competitive initiatives might have

Figure 19

Percentage of funds devoted to basic research by three CSREES funding instruments



Source: USDA, CRIS.

appeared to represent the most likely opportunities for additional research support. The reality, as we have shown in this report, was that other sources of funding from both Federal non-USDA departments and private companies were at least as important as USDA competitive initiatives. The overall impact of these external forces on the importance given to specific topics in the public agricultural research agenda is still unfolding. One question raised by the findings in this report must be whether this mix of funding sources is the one preferred in terms of the entire picture of public agricultural research support. Making this question even more difficult to answer is the fact that the pace and direction of basic and applied agricultural research itself is a function of technological developments that are evolving rapidly.

We have tried to delineate the trends leading to this situation. As new competitive avenues for public research are considered, and as new organizational structures are implemented, continued attention will need to be given to the preferred allocation of research funds among basic and applied topics and to the funding mechanisms that might be used to reach that allocation. This report is meant to help inform that effort.