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EDITORIAL

Agricultural Research

At one time, agriculture was the principal research area funded by the federal government. But today the sums appropriated for R&D on it are tiny in comparison with those allocated to space or health. While appropriations for many agencies have expanded greatly since 1955, those for R&D in the U.S. Department of Agriculture (USDA) have remained at about $780 million in terms of constant dollars. Most of these funds have been spent intramurally by the Agricultural Research Service. Some have gone to state activities. The USDA did not initiate competitive grants activities until 1978. At that time, the appropriation for them was only $15 million. Annual appropriations grew slowly to about $44 million in 1988.

There is no question about the major contribution made by the R&D supported by USDA during the past hundred years. And for much of that time, U.S. agriculture enjoyed special advantages of fertile soil, innovation in farm machinery, and low-cost petroleum products. But today strong global competition is with us. Imports of food into the United States are increasing. Other countries, including developing nations, are successfully engaging in research. Advanced countries are devoting relatively more attention to agriculture than is the United States. The percentage of total R&D funds devoted to a category that included agriculture, forestry, and fishing in 1988 were: United States, 1.9; Japan, 6.5; Germany, 3.1; France, 4.6; and United Kingdom, 5.5. Yields of food grains in other countries often exceed those in the United States. In some countries labor or fertile land is cheaper than in the United States. If the United States is to maintain or increase its favorable balance of trade in agricultural products, it must enhance the quality of its agricultural products and increase production efficiency. To do this will require devoting a larger share of its creative talent to basic agricultural research. A means to this end would be to expand the USDA competitive grants program. A rationale for doing this and legislation authorizing it are already in place.

In 1989 the rationale for an enlarged competitive grants system was supplied by the Board on Agriculture of the National Research Council (NRC). It issued a report* that was unusually effective. The document won approval from the Bush administration and led to action under Public Law 101-624 to foster a National Competitive Research Initiative. Recommendations of the NRC were followed quite closely in the crafting of the legislation. The NRC report spotlighted six targets: plant systems; animal systems; nutrition; food quality and health; natural resources and the environment; engineering, products, and processes; and markets, trade, and policy. The legislation also targeted the six. Descriptions of the six targets were similar. In the legislation, the following appears specifying an area to be supported:

> Plant systems, including plant genome structure and function; molecular and cellular genetics and plant biotechnology; plant-pest interactions and biocontrol systems; crop plant response to environmental stresses; unproved nutrient qualities of plant products; and new food and industrial uses of plant products.

Equally broad scope characterized specifications of the other areas.

The legislation also specified, "in seeking proposals for grants...and in performing peer review evaluations of such proposals the Secretaries shall seek the widest participation of qualified scientists in the Federal Government, colleges and universities, State agricultural experiment stations, and the private sector." The legislation authorized appropriations of $150 million for fiscal year 1991, $275 million for 1992, $350 million for 1993, $400 million for 1994, and $500 million for 1995.

To date that schedule has not been met. The actual appropriation for 1991 was $73 million and for 1992 and 1993 it was set at $97.5 million. A cap of 14% for overhead has been set. Nevertheless, there have been so many proposals that only about 22% could be funded for an average slightly over $50,000 per year.

It is early to ask about accomplishments. However, as one example, the tools and methods that were developed by National Institutes of Health and National Science Foundation investigators are being rapidly and successfully applied to plant and animal genomes and to detection of disease processes in both plants and animals. Research in areas included in the USDA competitive grants program (NRICGP) should have high priority and corresponding increased federal support.

Philip H. Abelson

*"Investing in Research: A Proposal to Strengthen the Agricultural, Food, and Environmental System" (National Academy Press, Washington, DC, 1989).