

Public Funding for Applied Agricultural Research: Its Future Is in Our Hands

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The historical success of U.S. agriculture has flowed from strong programs of applied research and technological development, which have emerged from a solid foundation of basic science. Agricultural progress depends on the continuum from basic science in the laboratory to field testing and finally to on-farm utilization of new products and technology for production of food and fiber. The United States needs both basic science, devoted to understanding the natural world at levels from molecules to populations, and applied science,

devoted to solving problems and developing new technology and systems for agricultural production and environmental management. Without strong basic science, applied research and development rapidly degenerate into repetitive testing with little real progress. Conversely, without strong applied research and development, basic scientific research does not benefit society in general or agricultural producers and consumers specifically. Increased public funding is needed for both basic and applied agricultural science. I believe that the applied end of the spectrum needs immediate attention if agricultural scientists are to address societal concerns regarding healthy food and the quality of the environment.

Unfortunately, many people think of applied research as merely the testing of products and techniques. Even though the support of such work may be an appropriate and needed use of public funds, political reality is that product testing is considered to be a private responsibility and cannot be a basis for increased funding. Support for research in applied agricultural science and technology will depend on the public's perception that such research will address their concerns. We must convince the public and their elected representatives that the only way the problems of agriculture will be solved and an abundant, safe food supply assured is through public funding of applied research and development.

To succeed in generating this support, we must address those major issues of agriculture that concern society. Agricultural pollution of water has received widespread publicity. Fears about chemical pesticide residues in fruits, vegetables, and other foods are changing consumers' purchasing habits and causing people to question agricultural production practices, especially those for pest control. During the past year, some agricultural scientists have publicly ridiculed people's fears regarding the growth regulator Alar and the EBDC fungicides that have been shown to have oncogenic effects in test animals. By making light of public fears about carcinogens, agricultural scientists create the impression of being unconcerned about public health. Plant pathologists are no more qualified to assess oncogenic risks than animal toxicologists are to assess plant disease. The evaluation of health risks from pesticides is best left to environmental toxicologists. If we are to receive increased funding, applied research and development must be perceived as addressing these high-priority concerns, and the public must view research as part of the solution rather than

part of the problems of agriculture.

Many environmental organizations with powerful lobbies want to assist in changing the way we practice agriculture. Their primary goals—healthy food, clean water, and no environmental degradation—should also be our goals. Agricultural and biological scientists should enlist environmental organizations to advocate public funding for applied agricultural research. For example, research toward integrated disease management and integrated crop management will continue to receive increased support through public funding, because these efforts address major public concerns. Environmental groups must be given a chance to participate in the conceptual development of research priorities if they are going to lobby for agricultural research funding.

Green plants are not only human food and animal feed but also sources of clean energy and chemicals for industry for the 21st century. The continuation of commodity price support programs and the cropland removal program gives the illusion that we are awash in surplus agricultural produce. In actuality, the nation and world have a narrow and shrinking margin between adequate food reserves for human nutrition and the threat of widespread famine. The nation and world also have shrinking reserves of clean energy. We must articulate the role of green plants in the world to our elected representatives as well as to society in general. As plant pathologists, we need to adopt a broad, holistic view of green plants, agriculture, and plant pathology.

Successful development of increased funding for applied agricultural research also depends upon a family-farm focus. A vast amount of goodwill on the part of the general populace is directed toward the family farm. A large part of the successful federal funding effort for the LISA (Low Input Sustainable Agriculture) program was and is based on proposed benefits to the family farmer. Although having a rough beginning, LISA should provide a start in achieving a solid funding base for applied research devoted to healthy food and to a safe environment.

Finally, the public and legislators need to recognize that new systems of agriculture will emerge only from the results of broadly based, publicly funded research. Agricultural business and industry will make expenditures primarily for the development of products and services. There are areas of applied research, especially in simulation, modeling, agricoecosystem analysis, and information management, where all nonprofit research institutions can participate.

Federal appropriations may be the only answer in some states with severe economic difficulties; in other states, excellent opportunities exist for increased state funding for applied agricultural research. For example, the Commonwealth of Pennsylvania provided almost 18% additional funding to Penn State's College of Agriculture for fiscal year 1989-1990. The funding increases are targeted for initiatives developed by the university in cooperation with the Agricultural Advisory Council and other citizen organizations of Pennsylvania. Seven major areas of research need were identified: Food Safety and Nutrition, Pesticide Safety, Water Quality and Management, Farm Profitability, Animal Health, Forest Resources, and Rural Economic Development. In addition, \$3 million was made available to the Pennsylvania Department of Agriculture for a competitive grants program to fund research directed toward solving agricultural problems in Pennsylvania.

Regardless of the source of funding, the key to increased support for applied research is addressing those major and broad issues of agriculture that concern society.