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Public Investment in Wheat Research — Economic Impact in the Western Region

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The Western Region of the U.S. produces about 22 percent of the nation's wheat and accounts for about 29 percent of public investment in wheat research.¹ With more competition for public funds in recent years, more pressure has been placed on public agencies to show their contribution to society's well-being.

A recent University of Idaho study established just what kind of return the public was getting for its research investment. The study established the rate of return to investment in wheat research in the Western Region Agricultural Experiment Station system. Specifically, the study assessed wheat research's contribution to increased productivity, the return to research investment and the benefits to both producers and consumers.

Wheat Productivity

The quantity of wheat produced is the product of the acreage harvested and the yield per acre. Wheat research has resulted in technological changes that have predominantly affected yields rather than the amount of acreage harvested.

The study found that research expenditures did increase yields significantly. During the period 1939-74, research expenditures increased wheat yields in the Western Region between 21.7 and 39 percent, depending on the analysis method used.

The study also found that research expenditures influenced wheat yields for about 14 years after the initial investment. The maximum benefit was realized during the 7th and 8th years after the initial investment. After the 8th year, benefits declined and approached zero at about the 14th year.



Several factors contribute to the decline in benefit return after the 8th year:

- A specific wheat variety may lose its resistance to certain diseases or pests.
- A new disease or strain of pests may evolve to which the variety is not resistant.
- Different production management problems may evolve that require different variety characteristics.

Thus, the study's results clearly indicate the need for continuous research and development of new technology to replace old technology. Timely investment in agricultural research critically affects the future cost and benefits from this research. To get the same benefit from \$1 spent on research conducted in the 1980s, national studies show the public will have to spend \$2.45 in the 1990s.²

¹States included in the Western Region are Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming.

²Araji, A. A. (ed). Proceedings: research and Extension productivity in agriculture. May 1978 Conference. Dept. of Ag. Econ. and App. Stat., Univ. of Idaho, Moscow.

Return to Investment

Return to investment in wheat research was measured by determining the internal rate of return. The study equated the present benefit value of research with the present value of the costs. The study's results indicated the rate of return for the Western Region ranged from a minimum of 38.7 percent to a maximum of 45.8 percent, depending on the analysis method used. In other words, for each \$1 invested in wheat research, the benefit received was worth between \$1.38 and \$1.45.

Consumer and Producer Benefits

The study found that consumers and society are the main beneficiaries of public investment in research. Because of the public expenditures on wheat research, producers were able to grow more wheat. The study's analysis showed that consumers would have had to pay \$3.6 to \$6.5 billion more (depending on the analysis method used) to have secured the same quantity of wheat during the 1939-1974 period. In general, investment in wheat research in the U.S. has helped maintain a situation — a situation in which consumers spend a relatively low portion of their disposable income on food.

Summary

The study's results imply that, in addition to a relatively high return on public investment in wheat research, it is consumers that have been the major beneficiaries from wheat research through low food prices. Further, the improved production efficiency, resulting from public expenditures in research, has greatly enhanced the nation's comparative advantage in the world wheat market. The U.S. wheat industry is a major contributor to the country's Balance of Payments. Wheat has been accounting for about 15 to 20 percent of all agricultural exports.

In addition to this research on public investment in wheat research, the University of Idaho has completed studies on the economic impact of investment in integrated pest management and the Dairy Herd Improvement Association in the Western Region. You can obtain copies of these research bulletins from the Department of Agricultural Information, University of Idaho, Moscow 83843.

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Other research publications on public investment in agricultural research are:

Araji, A. A. Feb. 1981. The economic impact of investment in integrated pest management. Res. Bull. 115, Univ. of Idaho, Moscow.

Araji, A. A. and R. L. Gardner. Feb. 1981. An economic evaluation of the DHIA in the Western Region. Res. Bull. 117, Univ. of Idaho, Moscow.

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