

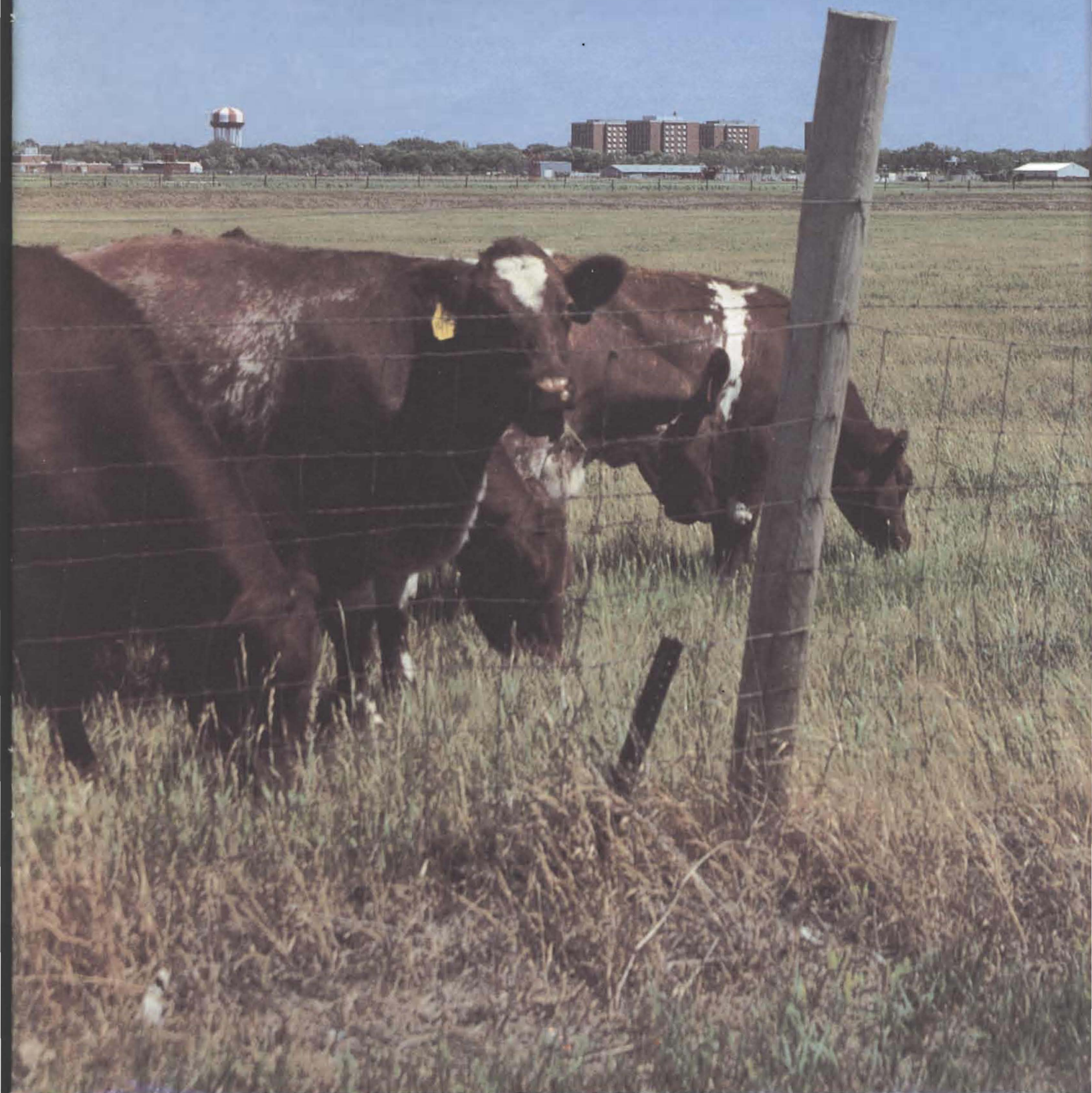


NORTH DAKOTA Farm Research

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Guest Column

C.N. Haugse, Chairman
Animal and Range Science



RETURN FROM LIVESTOCK RESEARCH

Agriculture, including animal agriculture, has been changing ever since the first cow was corralled or when someone planted the first seeds. Utilizing new technologies of the day, ranchers/farmers were able to grow more food and fiber than they had grown before. Change accelerated rapidly during the 20th century. Technology improved with fewer rancher/farmers required to provide for America's food and fiber needs.

The situation today is not new. Agricultural technology continues to improve with only two of every 100 people needed to produce the food and fiber for the United States. Today, most workers in agriculture live and work off the farms and ranches.

One of the measures of benefits from agriculture research is the percentage of disposable income spent for food by U.S. consumers. Data from the Economic Research Service indicates a decline of approximately 3 percentage points since 1965 (18.0 percent in 1965 to 15.1 percent in 1984). U.S. agriculture productivity has doubled since 1945 (from 58 percent in 1945 to 116 percent in 1984).

The ultimate payoff from agricultural research is to the producers who use the research results to increase production and/or to reduce costs, to the farm supply and marketing firms servicing the agricultural section and to the consumers who pay lower prices and have greater consumer choice because of larger product supplies and/or lower product prices.

It is difficult to measure the value or return for dollars invested in research. "Value added" is one measure used. It is defined as the difference between market value of products and cost of the inputs used up in the production process. "Value added" varies substantially for different commodities. It tends to be higher for crops than for livestock. In general, only commodities with substantial production value or that have future potential can carry the cost of major research programs.

Evenson (Yale University, 1979) reported the annual benefit for each \$1,000 invested by state experiment stations in research. The annual rate of return for technology-oriented research averaged 106 percent with a maximum benefit of \$14,900 for 1948 to 1971 expenditures. The annual rate of return for science-oriented research was 45 percent. A lag of several years is typical between the time research expenditures are incurred and their payoff occurs in the form of increased output, reduced costs or other forms of benefit to producers and/or consumers.

Continued on back cover

In This Issue

Livestock Agriculture: Research Incentives <i>Clayton Haugse</i>	3
The Brood Cow Efficiency Study - A Progress Report <i>D.G. Landblom, J.L. Nelson, L. Manske and P. Sjursen</i>	6
Russet Norkotah - A New Russet Potato Variety <i>R.H. Johansen, B. Farnsworth, N. Gudmestad, G.A. Secor, D.C. Nelson, A. Thompson, A.A. Boe and P.H. Orr</i>	11
Tillage Effects on Bulk Density During Reclamation of Mined Soil <i>S.A. Schroeder</i>	13
Educational Needs of North Dakota Agribusiness Managers <i>Bryan Olschlager and Don Priebe</i>	17
Economic Impact of Resident Hunters and Anglers in North Dakota in 1986 <i>James F. Baltezare and Jay A. Leitch</i>	22
Career Choices of North Dakota Adolescents: Major Influences <i>Richard Rathge, Ron Mullis, Ann Mullis</i>	25

On the Cover: Part of the NDSU beef cattle herd grazes at the edge of the campus. In this issue, Clayton Haugse discusses the importance of research on livestock production and health. Photo by Gary Moran.

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Norton (VPI, 1981) calculated the long run return for each dollar invested (marginal products) in agricultural research for two different time periods (1967 and 1974). He reported a return for cash grain research of \$24-42, dairy research \$20-27 and for livestock research (beef cattle, sheep and hogs) \$62-81. The internal rate of return to experiment station research was reported as 40-58 percent for cash grains, 35-44 percent for dairy and 75-88 percent for livestock research considering a seven-year lag. Livestock returns were higher than others, indicating the largest underinvestment in this area. Any return greater than 50 percent indicates underinvestment.

Agricultural productivity continues to grow with agricultural research described as being articulate, decentralized and undervalued. A research program must pay close attention to balancing effectively the mix between science-oriented and technology-oriented (adaptive) research which is expected to pay-off in terms of the state's economic growth.

Livestock as well as other agricultural research has shown a high return for each dollar invested. This should mean that both consumers and producers would request increases in

agricultural research budgets. Over the past 40-50 years, research has benefited consumers to a greater extent than producers. You would expect consumers to be first in line to insist on an increased commitment in agricultural research, but each individual consumer receives only a small share of these gains and as a result, only support agriculture research as a group when food prices rise very rapidly.

The NDSU livestock research thrust today and for the future is for efficiency of production - research which will allow producers to produce livestock more economically. Major thrusts are in the areas of range science, reproductive physiology and nutrition. Future research must continue to be site and situation specific, designed to yield information which will allow livestock producers to plan, implement and manage profitable production and marketing systems in each of the specific soil, climatic and socioeconomic areas of North Dakota. Adaptive research needs to be repeated at several locations over years as well as each time genetic potential is improved and when new or modified products become available. Dollars invested in livestock research have been cost effective in the past and will continue to be such in the future.