# Reflections

**H. Roald Lund**
Director
N.D. Agricultural Experiment Station

In September 1951, a young man from a farm in North Dakota came to the campus of the North Dakota Agricultural College. This person was the son of first-generation immigrants from Norway and Denmark. His parents had the dream of millions with similar backgrounds: that their son would be educated and make a contribution to this new and wonderful land.

This young man had decided to become a vocational agricultural teacher and was assigned to the advisorship of Shubel Owen, a teacher in Morrill Hall. As he made his way to the first meeting with Mr. Owen, who was to become a lifelong mentor, he would wonder about a building named after Justin Smith Morrill. Who was Morrill, and what did it mean to have a stately building on this campus in his name? Also, no doubt, he read some of the inscriptions painted on the building's walls: "Agriculture is the most healthful, most useful, and most noble employment of man" – George Washington; "No other human occupation opens so wide a field for the profitable and agreeable combination of labor with cultivated thought, as agriculture" – Abraham Lincoln.

The North Dakota Agricultural College drew upon three great federal laws: the Morrill Act of 1862, establishing colleges of agriculture; the Hatch Act of 1887, establishing agricultural experiment stations; and the Smith-Lever Act of 1914, establishing the Cooperative Extension Service. These unique laws set apart land-grant institutions like the NDAC from all other educational institutions in the world with a mission "to serve the land and its people," which became the Centennial motto for NDSU in 1990. The young man, who called Hillsboro, Christine, Nome, and Fargo his home, embarked upon a career at this land-grant university, NDAC, soon to become NDSU, the North Dakota State University of Agriculture and Applied Sciences.

He never did become a vo-ag teacher. The USDA durum wheat breeder assigned to NDAC started him on a program of work, as a helper, to breed a wheat variety resistant to the scourge of the wheat lands in North Dakota — race 15B stem rust. Drs. L.R. Waldron, Glenn S. Smith, Ruben Heermann, and Kenneth Lebsock all applied the 50-year-old science of genetics to plant breeding of HRS and durum wheat. At the same time, they mentored and encouraged this native son of North Dakota on the paths of plant research.

How the varieties came tumbling forth! Langdon, Ramsey, Yuma, Towner, Conley, Justin, and Waldron. What excitement!

The young man of our story, H. Roald Lund, was hooked. To become a teacher of agriculture and a researcher in plant breeding became his career objective, and his mission to serve "the land and its people" was established through the mentoring of Professor T.E. Stoa and Dr. Jack Carter, his first professional employers in the Department of Agronomy at NDAC. Then it was off to

Purdue University, another great land-grant university, for a final degree and an experience in corn breeding and genetics. The young man was now poised to begin a career in science and teaching at NDSU in 1965.

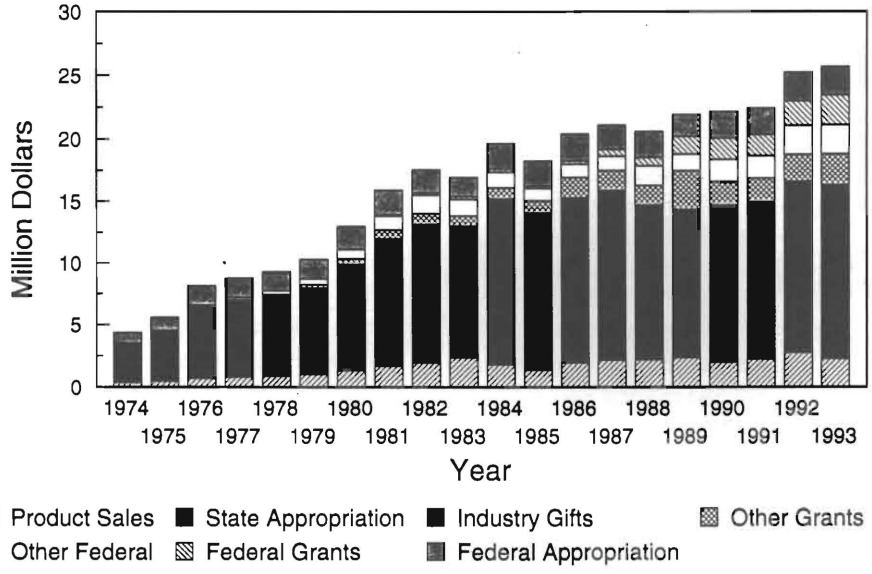
### A Quarter Century of Administration

Since its inception and until just recently, the College of Agriculture and the Agricultural Experiment Station were headed by a single administrator. Down through the years, the names of Shepperd, Walster, and Hazen were identified with this joint mission of teaching and research in agriculture at the North Dakota Agricultural College. During the time of Arlon Hazen (1956-78) the NDAC was to become NDSU. Again we see the impact of a mentor. Dean and Director Hazen added me to his staff in 1970 as assistant dean and assistant director to succeed Dr. John Callenbach, an entomologist who returned to the department to serve as chairman. My immediate assignment was to coordinate the agricultural research program. Peder Nystuen managed the day-to-day affairs of the college.

A program's success and excellence are often measured with dollars. In 1970, the total research budget was approximately $3.7 million a year, with agricultural research concentrated in only a few buildings on the campus; expenditures in 1993 were $25.7 million. Table 1 shows the steady growth of financial resources during the 20-year period from 1974 to 1993, a real tribute to the partnership of the faculty-staff and the federal-state constituency.

The impact of public funding for agricultural research is evident in the ratio of state and federal funds to other sources. The percentage that state General Fund dollars contribute to the total agricultural research budget has decreased steadily through the years (Figure 1). Today, the station budget is a more diversified mix of funding sources, including a growing number of competitively awarded grants. This leads to a second

**N.D. Agricultural Experiment Station Expenditures, 1974-1993**




measure of excellence and success: the faculty and staff.

As of the end of 1993, the NDAES had 147 scientist-teachers, 132 professional and 163 technical staff members, 50 clerical staff, and 104 graduate research assistants. I am proud to have had a part in developing this legacy of an outstanding faculty and staff. They are a strength that keeps on giving.

This strength is noted by the ability of a relatively young (43 years average age) and dedicated group of faculty (average tenure is 14 years) to seek and attain competitive grants (Figure 1). National Research Initiative (NRI) funds, supplemental to the Hatch funds (that come to each state on a formula basis), are available only by competitive grants writing. NDAES scientists have done very well in this nationally competitive program, with one of the highest success ratios for obtaining these funds in the nation. Much of this funding supports highly technical long-term research that will advance basic understanding of plant and animal growth and health, and these funds permit us to address problems of very real concern to farmers.

In addition to the resources of people and financial support, agriculture over the last 25 years has grown substantially in a third resource: facilities. Again, the land-grant federal-state partnership enhanced our ability to seek and secure funds from public and private sources to construct one of the finest research complexes in the United States (see following article). A brief tour of the campus would also reflect on our unique federal partnership as we view the Northern Crop Science Laboratory and the Northern Bioscience Laboratory. Both are part of the USDA-ARS Red River Valley Agricultural Research Center, whose scientists work in close collaboration with NDAES scientists.

One of the most rewarding dimensions of my administrative career at NDSU has been in the continuation and evolution of research and teaching programs of value to the citizens of North Dakota. For example, I view our publicly funded plant breeding program as one of the most comprehensive in the nation. It gives me great pleasure to travel the state of North Dakota and recognize the crops that were bred and developed at NDSU.

Also, we have seen the emergence of the branch stations at Carrington, Dickinson, Hettinger, Langdon, Mandan, Minot, Streeter and Williston and

the Agronomy Seed Farm at Casselton into research centers, staffed with individuals with advanced degrees in research and extension. A total of 17,400 acres of North Dakota land is currently held by the public for research in crops and livestock. Well over half of this land is dedicated to animal and range research, done on three of the major range ecotypes in the nation.

### The One Constant is Change

Clearly, the most common theme running through my life in agricultural administration at NDSU is *change.* I came from a farm family that had lived in four counties due to changes in land ownership, starting with my father's inability to buy the family farm from the estate. Changes continued. My father purchased land in the late 1940s in a township with more than 50 families, a thriving town, and rail and bus service only two miles away. Today, that township has few families and a town without major services. While we all believe change should occur for our benefit, rarely is that the case, and we usually must adapt.

Consider farming and ranching methods. Individuals farming during this century will have seen the most dramatic changes of any generation in the history of mankind. My father farmed in the early 1900s with tools and implements that would have been recognized by anyone during the Iron Age. By the time he retired, he had farmed with diesel tractors and driven an air-conditioned combine.

Dramatic change has also occurred in agricultural research and education. Earlier I commented on the 50-year-old science of genetics that was used to develop physiological resistance to plant disease. Prior to the 1950s, all new varieties were selections of crops grown throughout the world. USDA agronomists would travel the world and introduce to the United States the best naturally evolved crops for adaptation here. Superphosphate fertilizer and the role of legumes in nitrogen fixation were relatively recent discoveries in the late 1800s. Dire predictions that the world would face starvation and famine have not come true, due to modern genetic improvement of plants and animals, engineering, and mechanization that took much of the drudgery out of farming and ranching.

In some respects, positive changes in production and marketing agriculture have produced some not-so-positive changes in our socio-economic climate due to the loss of people on the land and the shrinking rural population base. However, as I reflect on the quality of life today on the farm or ranch, in most cases it is better than when I was a child: much of the drudgery and deprivation is gone. Change now must be focused on returning more of the market share from the consumer to the producer. We have spent more than 100 years taking the drudgery out of farming; now we must focus on putting jobs in the towns.

In recent years, I have been amazed at the knowledge and technical skills of the men and women we recruit into the NDSU system to do research and teaching. We have a first-class place to work and space-age approaches to problem solving. Changes in production, processing, and marketing technology have been speeded up dramatically due to computer simulations, facsimiles that reach around

*Roald Lund was a corn breeder before joining the administrative staff of the NDSU College of Agriculture and Agricultural Experiment Station. The corn in this photo from a 1969 issue of North Dakota Farm Research is described as part of a project searching for a day-length insensitive gene that might result in improved hybrids for North Dakota.*

the world at the speed of light, air travel, and a workforce that is part of the global agriculture arena.

Commodity organizations emerged in the second half of this century following farmer movements in the early century. The commodity organizations in North Dakota have provided valuable advice and leadership to my office through the years, and it is much appreciated. If we look at the trends in financial support for agriculture research, it is obvious that a greater burden will continue to fall upon the producer, processor, and user of commodities.

## Looking to the Future

I anticipate that changes in farming and ranching practices will continue, driven by the marketplace, the feelings of the consumer about the environment, conservation of resources, and food safety. To this end, we will see the development of a more intensive high-management, resource-sensitive approach to the management of crops, soil, water, and animals for the production of food, feed, fiber and fuel. Next-century agriculture will be more responsive to holistic thoughts and ideas in which the impacts of cultural, production, and processing practices will be viewed in an ecological setting. I see more diversity of crops, livestock, and rural enterprises in the future. Many will require partnering with each other, urban and rural, and business in a global setting.

In closing, I wish to acknowledge the tremendous contributions that have been made to my career and to the success of the NDAES, not only by individuals listed in this account but by individuals across this great state and region. The young men and women who come to NDSU as pioneers in their own career dreams continue to be the strength of our future. They always have been and always will be. We must continue to pursue the path of excellence laid down before us, by us, and for us in the future.

**Table 1. North Dakota Agricultural Experiment Station expenditures, 1974-1993.**

| Year | ---- USDA-CSRS ---- Hatch | Grants | Other Federal | State Appropriation | Sales Income | Industry Gifts | Other Grants | Total |
|---|---|---|---|---|---|---|---|---|
| | thousands of dollars | | | | | | | |
| 1974 | 824 | 0 | 43 | 3,037 | 369 | 43 | 22 | 4,339 |
| 1975 | 1,058 | 0 | 56 | 3,898 | 473 | 56 | 28 | 5,569 |
| 1976 | 1,543 | 0 | 81 | 5,683 | 690 | 81 | 41 | 8,119 |
| 1977 | 1,556 | 0 | 195 | 5,973 | 777 | 133 | 107 | 8,743 |
| 1978 | 1,540 | 0 | 322 | 6,183 | 861 | 190 | 181 | 9,277 |
| 1979 | 1,585 | 0 | 484 | 6,691 | 997 | 265 | 276 | 10,298 |
| 1980 | 1,790 | 49 | 769 | 8,202 | 1,305 | 402 | 441 | 12,958 |
| 1981 | 1,943 | 120 | 1,138 | 9,782 | 1,661 | 575 | 656 | 15,874 |
| 1982 | 1,871 | 198 | 1,475 | 10,522 | 1,905 | 728 | 853 | 17,552 |
| 1983 | 1,538 | 226 | 1,330 | 9,916 | 2,332 | 757 | 821 | 16,919 |
| 1984 | 2,032 | 248 | 1,258 | 12,575 | 1,763 | 858 | 904 | 19,638 |
| 1985 | 2,016 | 191 | 1,020 | 11,861 | 1,330 | 899 | 932 | 18,250 |
| 1986 | 2,115 | 271 | 1,093 | 12,583 | 1,922 | 784 | 1,616 | 20,385 |
| 1987 | 1,932 | 528 | 1,155 | 12,678 | 2,139 | 1,064 | 1,591 | 21,087 |
| 1988 | 2,041 | 675 | 1,601 | 11,792 | 2,163 | 762 | 1,539 | 20,573 |
| 1989 | 1,730 | 1,374 | 1,333 | 11,434 | 2,326 | 591 | 3,107 | 21,894 |
| 1990 | 2,077 | 1,671 | 1,805 | 12,118 | 1,958 | 620 | 1,877 | 22,126 |
| 1991 | 2,077 | 1,671 | 1,811 | 12,118 | 2,215 | 624 | 1,877 | 22,393 |
| 1992 | 2,255 | 1,910 | 2,296 | 12,981 | 2,725 | 918 | 2,123 | 25,208 |
| 1993 | 2,251 | 2,309 | 2,313 | 13,308 | 2,228 | 802 | 2,450 | 25,661 |