



NORTH DAKOTA
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Guest Column



DONALD E. ANDERSON
Associate Director

North Dakota Agriculture becomes more diversified with each passing year. The dynamic character of the state's farms ranches is characterized by the rising importance of "new crops" in the state's economy that were of little or no importance a decade ago. The index of crop production in North Dakota, which is a measure of total volume of crops produced, increased approximately 80 percent from 1967 to 1981. Similar increases are found in the livestock industry, where greater efficiencies in feed conversion have been accomplished and increased grassland production has been achieved through improved range management practices.

The economic future of North Dakota agriculture is tied closely to the ability of North Dakota farmers and ranchers to compete with other production areas throughout the United States and the world. This can be accomplished only if a flow of output increasing and/or cost reducing techniques continues to come from the research establishment.

The increased production generated by North Dakota's agricultural economy is to a considerable degree associated with greater intensification of the state's agriculture. A considerable shift has been made to a variety of row crops that represent more intensive production systems than the traditional cereal grains that have historically dominated crop production in the state. As an example, oil crop production has increased by approximately 500 percent in the past decade. Besides the rapid rise in sunflower production, we have also seen rising importance of other row crops such as dry edible beans, soy beans, corn, safflower, and highly specialized crops such as mustard and buckwheat. The additional acreages of these crops has generated increased income to the North Dakota economy. Realized gross farm income was 2½ times larger in 1979 than it was in 1971.

The production of new crops requiring more intensive management systems place a growing workload demand on the research and extension programs of your land grant university. The research dealing with each new crop requires plant scientists to develop new higher yielding and disease resistant varieties, soil scientists to evaluate fertility and soil structure issues, entomologists to develop insect control programs, pathologists to cope with disease control problems, weed scientists to develop weed control programs for the new crop, engineers to deal with tillage and harvest problems,

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On the Cover: Winter or summer, night or day, agricultural research virtually never stops. Expanded greenhouse facilities, pictured here early on a cold winter morning, are the site of both applied and basic research in the plant sciences. Photo by Mark Strand.



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H. R. Lund
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TABLE 2. PREHARVEST LABOR AND FUEL REQUIREMENTS, PER ACRE, OF CONVENTIONAL AND NO-TILL GRAIN PRODUCTION IN EASTERN NORTH DAKOTA, 1981

	Time Period	Spring Grain		Winter Wheat
		Conventional	No-Till	No-Till
		minutes		
Labor	Fall ^a	31	9	21
	Spring ^b	25	19	4
	Summer ^c	4	4	0
	Total	60	32	25
		gallons		
Fuel	Total	5.77	2.02	1.67

^a Machinery labor from August 21 to December 31.

^b Machinery labor from January 1 to May 20.

^c Machinery labor from May 21 to August 20.

foliar pathogens is more likely to be a problem under a no-till system, especially if the practice becomes widespread (4). It may be necessary to use fungicides to control this problem. The cost of two applications of fungicides would increase costs about \$13.00 per acre.

The surface residues present under no-till protect soil particles from the erosional forces of wind and water. Inclusion of a valve for soil loss in cost budgets would enhance the economics of no-till.

SUMMARY

When proper management has been utilized, spring seeded small grain yields under no-till are similar to conventional tillage yields. Costs of no-till on continuous cropping are slightly higher than production with conventional tillage practices when reductions are made in the amount of machinery owned. The high herbicide expenditures of complete chemical fallow presently make it economically uncompetitive with mechanical fallow.

Substantial cost and labor distribution advantages of raising winter wheat in untilled seedbeds make it an attractive alternative to conventional spring seedings. Seeding directly into stubble provides a more favorable environment for overwinter survival, enabling winter wheat production in areas previously considered too risky.

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cereal chemists to evaluate crop quality and economists to evaluate management systems. In addition to the applied research, each new crop needs research from the basic sciences to explore the fundamental issues of plant physiology, basic chemistry of plant systems, etc., if future advances in production are to be accomplished.

The new greenhouse pictured on the cover of this issue is one of many needed investments in the agricultural research establishment needed to help carry the load of increased research needs in the many new

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areas of crop production in North Dakota. It appears that in general production management problems increase as more intensive crops are introduced. Disease, insect and fertility issues are more numerous and complex for sunflower than were the production problems for the wheat or barley crop those acres replace. The same can be said for dry edible beans, corn and other of the intensive crops that are becoming significant additions to the North Dakota agricultural economy.

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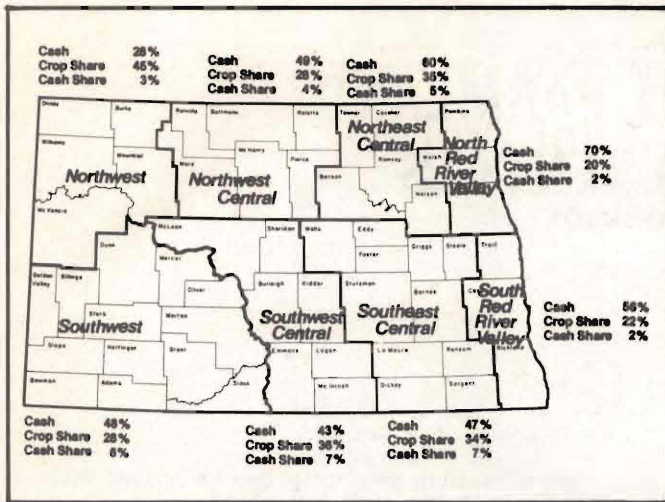


Figure 1. Percent of Leases by Type of Use, 1981

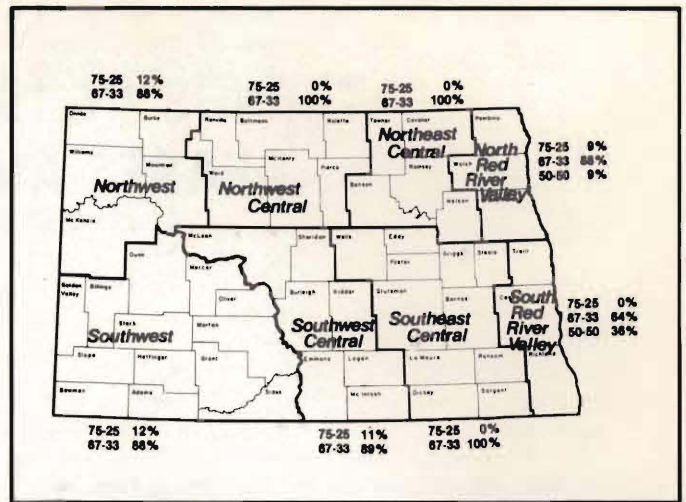


Figure 2. Percent of Crop Share Leases Reported for Wheat for 1981

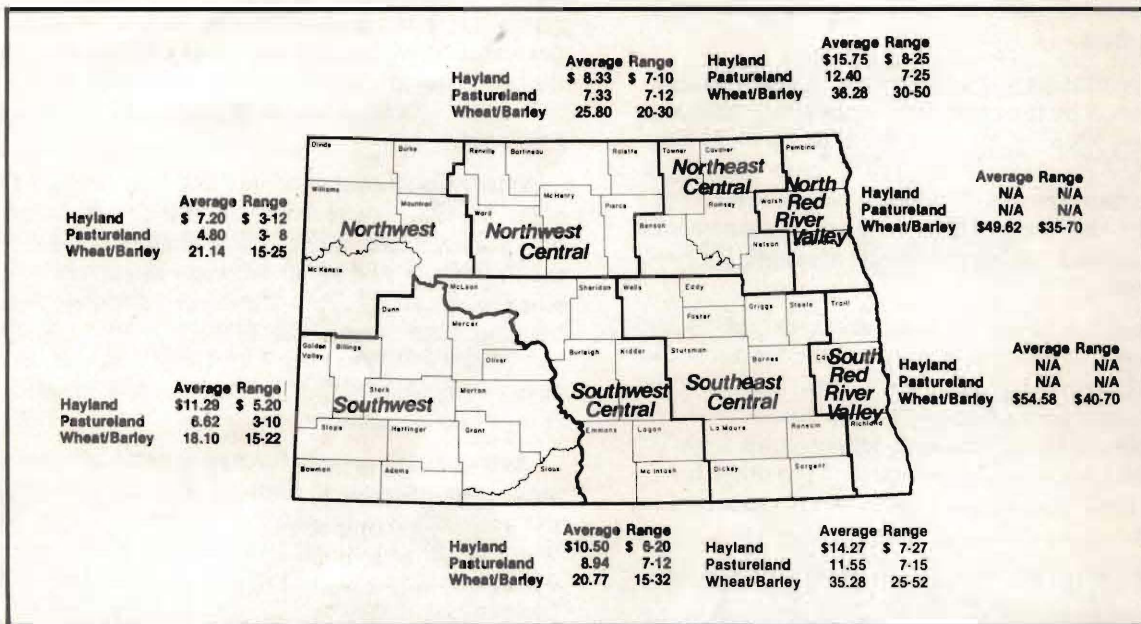


Figure 3. Cash Rents Per Acre for Hayland, Pastureland, and Wheat/Barley Land in 1981 and Computed Simple Averages and Ranges of Estimates

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Who would have thought that North Dakota would lead the nation in the production of wheat, sunflower and pinto beans in 1981? We need to work hard to maintain the leadership role our state has attained this past year.

With all these changes in North Dakota agricultural production, it has become apparent that there is a need for additional scientists in agricultural research and

education to push back the frontiers of knowledge in the many new and exciting areas of production that have taken their place in the state's economy in the 1970's. I am certain that the "new" crops of the 70's will be expanded in the 80's and still more "new" ones will be added to the list if we devote sufficient resources to the research and development of the state's farm and ranch resources.

Agricultural Experiment Station
NORTH DAKOTA STATE UNIVERSITY
of Agriculture and Applied Science
University Station
Fargo, North Dakota 58105
Publication

H.R. Lund

DIRECTOR

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