NORTH DAKOTA

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From the Director

A. G. HAZEN

Following is a letter from the President of the United States congratulating the State Agricultural Experiment Stations on their Centennial celebration. Certainly, we are most appreciative of such a letter from the President, especially since the White House is particular about doing such letters and this is a rare occurrence.

From President Gerald R. Ford:

"As part of the vast public research team of the United States Department of Agriculture and the Land Grant Universities, scientists at our State Experiment Stations have been responsible for developing more effective machinery, improved varieties and hybrids of crops and better farming and ranching practices that have led to dramatic increases in both yields and efficiency of livestock and poultry production.

"As these State Experiment Stations mark the one hundredth anniversary of their important service to our society, it is most appropriate that we pay tribute to their accomplishments.

"Beneficiaries of their research extend far beyond the agricultural industry. United States consumers have gained through the development of a food system that is the envy of the world. Societies everywhere have profited from the discoveries of such things as Vitamin A, streptomycin, aureomycin, dicumarol and the significance of amino acids to human diets. As a result of this work, we are no longer plagued with such afflictions as rickets, goiter, pellegra and scurvy. And we have useful treatments for tuberculosis and other diseases. A recent discovery of viroids is leading to studies of disorders in plants, animals and humans that have virus-like symptoms, but so far no apparent virus cause. The early climatic studies conducted in dairying by State Experiment Station scientists helped pave the way for our manned space ventures.

"The founding of the first State Experiment Station in New Haven, Connecticut, in 1875 was rapidly followed by the establishment of a second station in California. Today, every state has a station, and many have two. They represent an important network of critical research in climate,

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On The Cover: Winning float in NDSU's Old Fashioned Homecoming Parade on October 18 was this three-section, horse-drawn Bicentennial entry showing the Resident Instruction, Research and Extension arms of the College of Agriculture. (Photos by H.R. Lund).

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Table 6. Average carcass characteristics as affected by rations

	Ration Composition* (%)						
	Bly	22 MBP	28 MBP	36 MBP	20 PGS	40 PGS	60 PGS
Lots	1	2	3	4	5	6	7
Carcass weight (lbs)	593.25	613.40	620.20	624.20	582.60	564.00	553.20
Dressing %	57.40	58.83	58.36	57.69	56.98	58.02	57.25
% Kidney fat	1.92	1.86	1.69	2.14	1.60	1.59	1.47
Conformation[1]	11.50	11.60	11.80	11.00	11.40	11.80	10.60
Marbling score[2]	3.65	3.80	2.92	3.66	3.94	3.26	2.28
USDA grade[3]	8.25^{a}	7.60^{abc}	6.60^{c}	8.20^{a}	8.20^{a}	6.80^{bc}	5.20^{d}
Loin eye area, (sq. in.)	11.72	12.38	12.76	12.48	11.30	11.30	11.64
Back fat, in.	$.44^{a}$	$.37^{ab}$	$.32^{abc}$	$.45^{a}$	$.29^{abc}$	$.26^{bc}$	$.16^{c}$
Condemned livers	0	1	0	1	0	1	1

**All the substitutions were made on the barley — Bly = rolled barley, MBP = molasses beet pulp, PGS = pigeon grass seed*
[1] 12 = choice plus, 11 = choice avg., 10 = choice minus
[2] 4 = small, 3 = slight, 2 = traces
[3] 9 = good plus, 8 = good avg., 7 = good minus, 6 = standard plus, 5 = standard avg.
[a,b,c] Any two means in the same row without common superscript letter differ significantly $P < .05$

above average in protein content so protein supplements were not needed.

Pigeon grass seed, although high in protein, had an energy value for finishing cattle even lower than the Morrison's estimate of 58 per cent, making it only slightly higher than hay.

More research is needed to ascertain how best to use this type of screenings and why swine digest the pigeon grass seed better than cattle.

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soil, moisture, terrain and other conditions crucial to successful agriculture. Millions of students at the Land Grant Universities have obtained a basic foundation for their studies through the research conducted at these stations. And that foundation has extended throughout all the basic sciences.

"American agriculture has developed from the point where one farmer produces food for himself and nine others to where he produces enough for himself and more than fifty others. Many agricultural scientific discoveries have enabled our farmers to achieve this level of production. The creation of hybrid corn, the development of a vaccine against Newcastle disease of poultry, the control of wheat rust and the abolishment of rust epidemics and discoveries of how to innoculate worn soils to make them more productive are but some of the many modern findings that have made agriculture more productive. The development of sophisticated farm machinery has made it possible for only five percent of our workforce to produce the food and fiber we need.

"As the world population and food requirements grow literally by the hour, the future task of science and education seems almost overwhelming. Fortunately, the past achievements of our joint Federal-State research system, of which the State Experiment Stations are a major part, help us to look .forward to tomorrow with hope and confidence."

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barley production was for feed. At a wheat price of $2.95 wheat partially replaced sunflowers. The livestock enterprises remained relatively stable until wheat reached a price of $4.20 per bushel. At that price the purchased calves for backgrounding were substantially reduced due to the high opportunity cost of producing barley. When wheat was increased to $7.20, it became more profitable to sell the calves from the beef cow herd at weaning and further reduce barley production. A limitation in seeding capacity prevented further specialization in wheat at the higher price levels. Converting native hay and pastureland to wheat was not an allowed alternative.

The Effect of Fuel and Fertilizer Prices on Farm Plans

Fuel and fertilizer prices tend to move together since they are both related to the price of energy. In this analysis, both fuel and fertilizer prices were increased by 10 per cent increments up to three times the base price. Three alternative levels of nitrogen fertilizer for wheat on nonfallow were included for this analysis. Yields were 32.2 for 50 pounds N, 31.0 for 40 pounds N, and 26.1 for 20 pounds N. Results of the analysis are presented in Table 7.

The profit maximizing enterprise organization was not affected until fertilizer and fuel prices nearly doubled from their base levels. At this price level, 309 acres of wheat were replaced by flax due to lower fertilizer requirements. On the remaining wheat, the nitrogen fertilizer rate was dropped to 40 pounds per acre and a portion was raised on summer fallow. At higher fertilizer and fuel prices, both wheat and barley were grown on summer fallow to reduce nitrogen fertilizer requirements. Fertilizer and fuel prices had little effect on the optimum livestock organization. Returns to labor and management were reduced $13,100 between the lowest and highest fuel and fertilizer prices.

Conclusions

Changes in wheat prices tended to change the most profitable mix of small grains and flax on a typical farm in the study area. Wheat price had less effect on the profitablity of sunflowers because they did not compete as directly for labor at the same time of the year. At high wheat prices livestock feeding was less attractive. However, the use of more tillable land, existing buildings and available labor continued to find profitable use with breeding livestock.

Increases in fertilizer prices tended to make flax profitable relative to wheat and reduce fertilizer application rates. Increased nitrogen prices made the practice of summer fallowing an economical way to reduce purchased nitrogen. Higher fuel prices had little effect on farm plans but reduced net income.