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**ADJUSTMENTS BY A CENTRAL SOUTH DAKOTA
FARMER TO WEATHER AND PRICE
1928-1951**

by

Robert W. Luken

**Bachelor of Science Degree at South Dakota State College,
March 1951**

A Thesis

Submitted to the Faculty

of

The South Dakota State College

of

Agriculture and Mechanic Arts

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**In Partial Fulfillment of the Requirements
For the Degree of Master of Science**

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ADJUSTMENTS BY A CENTRAL SOUTH DAKOTA
FARMER TO WEATHER AND PRICE
1928-1951

By

Robert W. Luken

This thesis is approved as a creditable independent investigation by a candidate for the degree, Master of Science, and acceptable as meeting the thesis requirements for this degree, but without implying that the conclusions reached by the candidate are necessarily the conclusions of the major department.

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CHAPTER 1

INTRODUCTION

This is a case study of a single farm in the transition area of central South Dakota. The information available on cost-price relationship and influence of weather on organization of a farm is for groups of farms as recorded in the Census data and South Dakota Crop and Livestock Reporting Service Reports. All this information indicates average results and averages while useful conceal as much as they reveal.

Statement of the Problem

Major changes in farm organization may be the result of cost-price ratios or weather affecting production of the farm. ^{1/} There are other factors which may influence changes made in organization of a farm, but continuous data on those factors was not available. Particular attention was given to the importance of weather and cost-price ratios since these two factors were available. Weather and cost-price ratios influence the livestock enterprise and cropping system followed on the farm. Over a period of years the organization of a farm may change several times in response to the variability in weather and cost-price ratios.

What have been the changes in organization of a single farm in central South Dakota in response to changes in weather and cost-price ratios? The price of farm products sold and annual precipitation for the area are available. In what manner did they influence changes in the organization? If any sharp change occurred in either of these two factors, one would expect the organization to shift in response to the change in either or both of the variables.

^{1/} This study did not consider alternatives other than those selected by the operator.

Importance of the Problem

The Agricultural Census, South Dakota Crop and Livestock Reporting Service annual report, and Farm Records Projects all work with average figures. The available data are average figures of crop acres, yields, prices, and livestock numbers for a county, area or state. Government agencies, bankers, and business men faced with such agricultural problems as management, tenancy, and credit policies use these average figures as a guide in arriving at their decisions. While it is important to know average figures for a county, area, or state, the acreage, yield, price and livestock numbers for an individual farm may vary considerably from the average and the wide variability of conditions affecting individual operators will be lost in average figures. Averages tend to shade out the impact of weather and price on the organization of a single farm.

The change that has taken place in organization and operation of farms over the last 20 years is evident in the average figures. Average figures, while they do indicate the change that has taken place, do not point out all the problems that farmers encounter. A closer examination of a farm in central South Dakota is necessary before specific reasons for the change can be stated other than as generalizations.

Purpose of Study

The purpose of this study was to determine what have been the changes in farm organization of a single farm in central South Dakota arising from changes in weather and cost-price ratios. This study was not to justify changes made in farm organization of farms in central South Dakota but rather to show how a farm changed in response to changes in weather and

cost-price ratios. The analysis of the farm was not to decide whether a change was profitable or unprofitable or what changes might have taken place, but rather what motivated the operator to change the organization. Was it weather conditions or price levels? Were the movements of the grain and livestock enterprise similar, or did the operator expand in one while decreasing the other? An attempt will be made to answer questions such as these in relation to changes in weather and price. The farm selected should not be judged a typical farm for the North Central Area of South Dakota.

CHAPTER II

PROCEDURE

The method used in determining changes in farm organization was a case study of a single farm. The selection of a farm was limited by the period covered, available records, and willingness of the operator to permit a study to be made on the farm. The operator of the farm selected has been a cooperator in the South Dakota Agricultural Extension Service voluntary farm record project between 1935-1943 and the South Dakota Agricultural Experiment Station farm record projects since 1943. 1/

The voluntary farm record service, as carried out by the South Dakota Agricultural Extension Service, was a program whereby farmers sent in their farm records to the college for summarization. Each farmer who submitted a fairly complete record book was included in a summary report for his area. These record books furnished information which was useful for extension purposes, but the record books were incomplete and the number was too small to be an adequate size sample for research purposes. The information collected and summarized was for income and expenses only, without basic production records, acreages or livestock numbers. Record books for the farm selected could be obtained from the operator back to 1928, and in order to fill the gap between 1935-43, the complete and original record books of the cooperator were used for the period 1928 to 1943.

Since 1943, the South Dakota Experiment Station, with assistance from the South Dakota Extension Service during the early years, has obtained farm record data in the two areas designated for study, namely the

1/ South Dakota Agricultural Experiment Station Project No. 137, Management Factors Affecting Farm and Ranch Incomes.

Southeastern and North Central Area. Supplementary information on farm organization, crop and livestock practices, labor utilization and other factors pertaining to the farm business was obtained through suitable survey schedules on field trips to farms selected for the study. Information on the case farm was available from farm record summaries of the farm each year for 1943 through 1951. Some information which was needed for this study was not available in the summaries and the original farm record books were used to supplement the summaries.

Record Analysis

The farm record books and farm record summaries for the case farm were analyzed on a year to year basis. Farm receipts and farm expenses were classified as to type as were the livestock enterprises. Input and output data were summarized by enterprise as far as could be done with the information available. On the cost side it was not possible to allocate feed costs between dairy and hogs or between beef and hogs since feed records for each livestock enterprise were not kept. Machinery used on the farm was classified as either power machinery or crop and general machinery. Total crop acres were broken down into the acres seeded for each crop and the yield per acre. Tame hay was handled in a similar manner. Work units on the farm were divided into two groups, work units on productive livestock and work units on crops.

Personal Interviews

The change in organization between years and over the period studied was evident in the year to year analysis of the farm record book and farm record summaries. The reason for the change was not always present in the

farm records or summaries and interviews with the farm operator provided information as to the reasons a change was made. The author had three interviews with the farm operator in March and April of 1953 which lasted between two and four hours each. The interviews began with specific questions from the records and were permitted to develop into a general discussion on the policies of the operator in regard to management of the farm. There was much information gathered during the interviews which contributed to the general history of the farm and reasons for changes in organization.

The capital structure, labor supply and willingness to go in debt are all factors which could determine the change made on a farm. The data collected occasionally revealed the influence of the above three factors on management's decision to change. Whenever it was possible to include the three factors as an influence on the operator's decision, it was included in the analysis. Listed in the Appendix will be some supplemental information which was not complete and could not be included in the analysis.

CHAPTER III

GENERAL HISTORY OF THE FARM

Introduction of the Farm

The farm selected for this study is located in Faulk County, South Dakota. Faulk County is located in the north central section of the state between the James River and Missouri River. This area is commonly referred to as the transition area. This transition area is between the more intensive farming area to the east and the range area to the west. ^{1/} Within the transition area there is both small grain farming and ranching.

Faulk County Agriculture published by the South Dakota Crop and Livestock Reporting Service lists the distribution of land use in 1949 as follows: "(1) 63 percent of the farm land was in crops, (2) 32 percent in pasture, (3) 5 percent for other." ^{2/} Grouping of the land into use indicates that small grain farming is dominant.

Faulk County is located in the wheat area of central South Dakota. Within the wheat area of South Dakota there is a considerable amount of cattle and sheep ranching. W. P. Cotton made a study of livestock marketing practices in South Dakota in 1942. ^{3/} This study showed that ~~steers~~ and feeder cattle made up approximately 80 percent and slaughter cattle 20 percent of all cattle sales in 1940 for the area. In the case of sheep, 43 percent sold were for slaughter and 34 percent sold as stocker and feeders.

^{1/} C. R. Høglund, Facts for Prospective Farmers and Ranchers in South Dakota, South Dakota Agriculture Experiment Station Circular 59, 1945, p. 8.

^{2/} R. J. Ries, Faulk County Agriculture, South Dakota Crop and Livestock Reporting Service, 1952, p. 4.

^{3/} W. P. Cotton, Livestock Marketing Practices in South Dakota, South Dakota Agriculture Experiment Station Bulletin 362, 1942, pp. 14-19.

No extensive soil survey work has been carried on in Faulk County, so only generalizations as to soil type can be made on the farm selected. James Beardsley, Assistant Agronomist at South Dakota State College, describes the soil in Faulk County.

"Faulk County soils are about equally divided between two Great Soil Groups. The western half of the county lies in the zone of Chestnut soils while the eastern half is in the zone of Chernozems. Chestnut soils are characterized by dark brown surface layers and a horizon of lime accumulation within 18 inches of the surface. Chernozem soils have dark grayish-brown to nearly black surface layers and the horizon of lime accumulation occurs at a greater depth than in the Chestnut.

The principal soils of the western half of the county are the Williams, Zahl and Estevan. These soils are formed directly from glacial till parent material.

Approximately the eastern one-fourth of Faulk County has soils of the Barnes-Buse-Aastad association. Barnes soils are very similar to the Williams series except that having developed in a region of somewhat higher rainfall, the surface horizons may be somewhat deeper and darker and the zone of lime accumulation is found at a greater depth.

The remainder of the county lying between the Williams-Zahl-Estevan area in the west and the Barnes-Buse-Aastad area in the east is occupied by the Barnes-Beadle-Cresbard-Turton Association." ^{4/}

The small grain unit of the farm is located in the Barnes-Buse-Aastad association. The pasture unit is located in the Barnes-Beadle-Cresbard-Turton association. ^{5/}

Rainfall for the general area averages about 18-20 inches annually. Precipitation for Faulk County during the period studied averaged 17.24 inches with a high of 27.56 inches in 1942 and a low of 9.64 inches in 1934. ^{6/} Crop production is very dependent on adequate rainfall during the

^{4/} R. J. Ries, Faulk County Agriculture, South Dakota Crop and Livestock Reporting Service, 1952, pp. 6-7.

^{5/} Appendix A for more discussion on Soil of Faulk County.

^{6/} Appendix B, Table 1.

growing season and yearly fluctuation of rainfall are evidenced in crop yields. 7/

Organization of the Farm in 1928

In 1928, the farm was operated by the father of the present operator. The business was not a partnership, but rather a joint father-son operation with each owning part of the business. The father had controlling interest of the land, machinery, and livestock. To eliminate the dual ownership for purposes of this analysis all property with income and expenses for the farm was listed under one owner.

The farm unit of 640 acres was owned by the operator the first year of the study. Of the total, 370 acres were in crops, 160 acres in pasture, and 100 acres in native hay. Feed crops made up the greatest percent of the small grain acreage with wheat being the only cash crop raised. Horses furnished power for the farm with a complete line of horse machinery on the farm the first year of the study.

The livestock enterprise consisted of dairy cattle and hogs. An average of 12 cows were milked the first year and 14 litters of pigs were farrowed. Milking shorthorn dairy cattle were used and there were no beef cattle on the farm nor had there been prior to 1928.

The farm, as it was in operation the first year of the study, was a dairy-hog farm. Grain farming was primarily the raising of feed grains for livestock use. Wheat was the only cash crop raised, with income from the sale of grain supplying 43 percent of the total income. Sale of livestock

or livestock products was 52 percent and miscellaneous 5 percent of the total income.

Changes in Organization Over Period Studied

Livestock Enterprise 1928-35.—Farmers in central South Dakota had to shift their farm organization during the thirties to meet drought conditions and low price levels. The farm studied was no exception and had to shift organization and operation during the thirties.

There was no significant change in the livestock enterprise until 1934, when the first Agriculture Adjustment Act as passed in 1933 became effective. The destruction of cattle and hogs was practiced not only to cut supply down, but to decrease the number carried over on the short feed supplies. In the case farm studied, the drought had been very severe and not enough feed was raised to winter the livestock. The Federal Government bought part of the cattle herd reducing the number of dairy cows from 17 head in 1933 to seven head in 1934.

The following year saw a slight increase in dairy cows and a large decrease in other cattle. ^{8/} The number of young stock on the farm decreased from 32 head in 1933 to 9 head in 1935. Part of the young stock was sold to the Federal Government in 1934, and liquidation continued the following year through regular marketing channels.

There was an increase in number of sows farrowed until 1931 followed by sharp drop the next two years. A low of six litters was farrowed in 1934 with an increase of three more sows farrowed the following year.

^{8/} Other cattle includes: calves, yearlings, heifers, and steers.

There was no substantial change in the number of horses over the entire period. Horses furnished the power for the farm machinery and their number could not be reduced without affecting the whole farming operation (Table 1).

Table 1. Livestock Enterprise on Case Farm, 1928-35

Year	No. Dairy Cows	No. Beef Cows	Other Cattle	No. Litter Pigs	No. Horses
1928	19	—	23	14	15
1929	17	—	27	20	12
1930	16	—	29	31	17
1931	22	—	25	31	16
1932	18	—	29	16	15
1933	17	—	32	15	14
1934	7	—	22	6	12
1935	11	—	9	9	14

Grain Enterprise 1928-35.—Grain farming followed a pattern opposite the livestock enterprise over this period. No major increase in acreage for crops took place until 1934 and again in 1935, whereas the livestock enterprise was cut down in 1934 and 1935. Small grain and row crop acreage was almost entirely seeded to feed grains and wheat, the cash crop. There was no wheat raised by the operator from 1930 through 1933. The landlords share of wheat from land rented out was to serve as a cash crop. The acres of land rented out increased sharply at first and then gradually decreased until no land was rented out in 1935 (Table 2)

Livestock Enterprise 1936-40.—The livestock enterprise underwent a major change during the mid-thirties as there was a shift from dairy to beef production in 1936. The change from dairy to beef production was facilitated by the dual purpose type cattle and the increase was a natural

Table 2. Use of Cropland on Case Farm, 1928-35

	1928	1929	1930	1931	1932	1933	1934	1935
Crop Acres ^{a/}	370	345	350	360	350	350	547	646
Land Rented Out	—	25	480	320	320	365	160	—
Corn Acreage	130	90	120	65	130	70	120	80
Wheat Acreage	90	70	—	—	—	—	125	180
Oats Acreage	45	60	60	30	40	40	55	65
Barley Acreage	35	40	90	80	85	100	50	190
Rye Acreage	—	—	—	—	—	—	50	—
Broom Acreage	15	30	30	60	30	20	13	20
Flax Acreage	—	—	—	—	—	—	—	—
Fallow Acreage	—	—	—	—	—	—	119	40
Corn or Cane Fodder Acreage	30	30	35	85	30	75	—	70

^{a/} Includes acreage of tame hay, row crops, and small grain.

growth of the herd. No breeding cattle were purchased, therefore, the increase in cows was slower than the increase in other cattle. The heifers were kept for breeding stock and it took two or more years before the heifers were ready to calve.

The hog enterprise was on the decrease during the period of 1936-40. An exception to this was 1939 when 14 litters of pigs were farrowed. It is interesting to note that the production of pork on the farm was decreasing during this period while the production of beef was on the increase. The number of horses declined slowly during the period with the use of more tractor power on the farm beginning in 1935 (Table 3).

Table 3. Livestock Enterprise On Case Farm, 1936-40

Year	No. Dairy Cows	No. Beef Cows	Other Cattle	No. Litter Pigs	No. Horses
1936	3	11	15	21	14
1937	5	10	25	11	11
1938	3	15	23	10	9
1939	3	20	30	14	11
1940	4	24	42	8	10

Grain Enterprise, 1936-40.—The grain farming enterprise was relatively stable during this period except 1940 when no land was rented out accounting for part of the increased crop acreage. The crop acreage increased about 300 acres. There were no major changes in acreage seeded of corn, oats, and wheat, while barley acreage increased about three times during the five years. For the remainder of the crops raised, acres seeded remained about the same. There was a noticeable increase in corn and cane fodder acreage. At the same time part of the land was summer fallowed each year which had not been the practice previously (Table 4).

Table 4. Use of Cropland on Base Farm, 1936-40

	1936	1937	1938	1939	1940
Crop Acres ^{a/}	576	509	539	597	852
Land Rented Out	70	136	136	136	—
Corn Acreage	140	130	126	68	160
Wheat Acreage	130	100	117	125	176
Oats Acreage	60	50	27	54	40
Barley Acreage	70	60	64	122	200
Rye Acreage	60	30	39	44	16
Bumper Acreage	14	14	7	—	—
Flax Acreage	—	—	—	—	—
Fallow Acreage	86	124	73	33	100
Corn or Cane Fodder Acreage	—	—	85	151	145

^{a/} Includes acreage of tame hay, row crops, and small grain.

Livestock Enterprise 1941-45.---There was a rapid expansion in the beef cattle enterprise during this five year period. The number of beef cows more than doubled while the number of cattle used for dairy purposes remained almost constant. The number of other cattle is about double the number of beef cows each year. Included in other cattle are all cattle other than beef cows and dairy cows which accounts for the large number. A major shift in the type of beef cattle took place in 1939 and again in 1941. Beginning in 1939, any cattle bought for breeding purpose were Herefords and a Hereford bull was purchased in 1941. The Shorthorn cows were replaced with Hereford heifers when the heifers were old enough to breed. It took several years before the Shorthorns were replaced with Herefords in the breeding stock.

The number of sows farrowed increased sharply in 1942 and again in 1943. In 1943, the peak was reached as to number of sows farrowed with a sharp decline in farrowings taking place in 1944 and a leveling off the following year.

With more mechanization of farming in 1941 and 1942 the need for horses decreased. The number decreased only slightly over the period; but when compared with the previous five years, the drop is noticeable (Table 5).

Table 5. Livestock Enterprise on Case Farm, 1941-45

Year	No. Dairy Cows	No. Beef Cows	Other Cattle	No. Litter Pigs	No. Horses
1941	6	31	53	13	7
1942	6	43	80	28	6
1943	8	45	93	33	7
1944	8	69	118	13	6
1945	8	70	136	12	6

Grain Enterprise, 1941-45.---The change in acres of tillable land was very small over the five year period. There was an increase in total acres operated, but the increase was in non-tillable land. The change that did occur was in acres of certain crops seeded. Corn, wheat, barley, and oat acreage increased over the five years. Acres sown to barley was very high in comparison to acres sown in past years. A sharp drop in barley acreage took place in 1945.

The increased acreage for corn, oats, barley and wheat replaced the acres of corn and cane fodder or summer fallow taken out of production. The production of roughages was decreasing and the production of feed grains was increasing.

No land was rented out during the entire five years as more land was purchased for use other than crop production (Table 6).

Livestock Enterprise, 1946-51.---The period following the war saw the cattle enterprise increase at a slower rate than during the period 1940-45. Beef cow numbers fluctuated around 130 head while the number of other cattle was around 150 head. Part of the beef cow herd was put out on a share agreement with other farmers. The number on shares increased the first four years and then decreased sharply in 1951. With a 60 percent decrease in number of dairy cows, milk production dropped to a level where only the household needs were satisfied.

Pork production was relatively stable over the period except 1950 when there was an increase in number of sows farrowed. The number of sows farrowed dropped back to the post war level in 1951. With more mechanization of the farm after the war, the need for horse power decreased (Table 7).

Table 6. Use of Cropland on Case Farm, 1941-45

	1941	1942	1943	1944	1945
Crop Acres <u>a/</u>	802	802	909	852	836
Land Rented Out	--	--	--	--	--
Corn Acreage	160	160	190	215	230
Wheat Acreage	175	155	175	183	171
Oats Acreage	80	100	160	104	190
Barley Acreage	210	165	150	207	50
Rye Acreage	17	58	40	--	30
Broom Acreage	--	--	--	--	--
Flax Acreage	30	--	--	28	--
Fallow Acreage	--	--	100	--	--
Corn or Cane Fodder Acreage	160	190	--	49	10

a/ Includes acreage of tame hay, row crops, and small grain.

Table 7. Livestock Enterprise on Case Farm, 1946-51

Year	No. Dairy Cows	No. Beef Cows	Beef Cows on Share	Other Cattle	No. Litter Pigs	No. Horses
1946	8	122	10	122	8	6
1947	8	127	68	154	7	5
1948	4	120	50	171	8	5
1949	2	135	75	156	12	-
1950	3	142	72	142	27	-
1951	3	136	12	172	10	-

Grain Enterprise, 1946-51.—Total crop acres increased each year for this period. Increased acreage of cropland is reflected in the increased acres sown to corn, oats and wheat. The acres sown to these three crops during this period was greater than in any previous period while acres sown to barley dropped back to the pre-war level. Flax was raised each year for a cash crop and this had not been the practice previously. A high of 110 acres was seeded to flax in 1947. Corn or cane fodder were raised only two of the six years studied. The general movement of the operator was toward more land in crop production (Table 8).

Summary of Change in Livestock and Grain Enterprises

A complete change in the livestock enterprise was accomplished on the farm over the period 1928-51. The emphasis was on dairy production until 1936 and then a change to beef took place and the emphasis was on beef production the remainder of the time under study. The increase in beef numbers was slow at the start, but as more and more heifers came of breeding age the numbers increased more rapidly. With the emphasis on beef production, dairy sales remained relatively constant after the change. 9/

Table 8. Use of Cropland on Case Farm, 1946-51

	1946	1947	1948	1949	1950	1951
Crop Acres ^{a/}	882	926	975	980	1027	1041
Land Rented Out	—	—	—	—	—	—
Corn Acreage	285	200	220	230	260	100
Wheat Acreage	180	150	215	220	207	341
Oats Acreage	120	225	190	190	200	170
Barley Acreage	90	160	155	35	30	28
Rye Acreage	—	7	—	—	40	55
Bumper Acreage	—	11	8	—	—	14
Flax Acreage	89	110	42	35	50	58
Fallow Acreage	—	—	—	70	40	60
Corn or Cane Fodder Acreage	25	—	—	—	—	40

^{a/} Includes acreage of tame hay, row crops, and small grain.

Pork production followed no regular pattern in the number of sows farrowed each year. The factors which influenced the number of sows farrowed each year will be discussed in the following chapter. Table 9 shows the average number of each kind of livestock held each period and the trends in livestock numbers can be seen rather easily.

Table 9. Average Number of Livestock Each Year During the Four Periods on Case Farm, 1928-51

Year	Dairy Cows	Beef Cows	Other Cattle	No. Litter Pigs	No. Horses
1928-35	16	—	24	18	14
1936-40	5	16	27	12	11
1941-45	7	51	96	19	6
1946-51	4	130	154	12	2

There was a steady expansion in the number of acres cropped each year from 1928-1951. The increase shows up in the increased acreage needed to corn, wheat, and oats each period studied. Barley acreage increased the first three periods and decreased some the last period. Summer fallow and corn or cane fodder acreage followed a pattern similar to barley. The reason for shifts in acreage of certain crops and the livestock enterprise will be discussed in the following chapter (Table 10).

Table 10. Average Number of Acres Each Year for the
Four Periods on Case Farm, 1928-51

	1928-35	1936-40	1941-45	1946-51
Crop Acres ^{g/}	415	514	840	938
Land Rented Out	209	95	—	—
Corn Acreage	100	125	191	216
Wheat Acreage	116	129	172	218
Oats Acreage	99	46	127	182
Barley Acreage	84	103	154	83
Rye Acreage	50	37	36	34
Hummer Acreage	27	12	—	11
Flax Acreage	—	—	29	64
Fallow Acreage	79	83	100	56
Corn or Cane Fodder Acreage	50	127	102	32

^{g/} Includes acreage of tame hay, row crops, and small grain.

CHAPTER IV

REASONS FOR CHANGE IN FARM ORGANIZATION

Livestock Enterprise

This chapter will attempt to point out the changes in the livestock and grain enterprise and the reason for changes being made. In what manner did weather and cost-price relationship influence the operator's decision to shift or expand and contract ~~certain~~ enterprises? Where there was a major change in the organization, did the change result from future expectations or did the present price and weather conditions prompt the change? If the change was made without consideration of the present price and weather conditions, what did influence the decision of the operator to shift the organization? Did the element of risk and uncertainty influence the decision of the operator or were there some other indirect influences? An attempt will be made to answer questions of this nature in relation to changes in the livestock enterprise that occurred on the farm.

Dairy to Beef.—Dairy production was one of the livestock enterprises on the farm in 1928. Total dairy sales amounted to \$987 with an average of 12 cows milked during the year. Even though price of butterfat dropped, production per cow increased enough so total sales were \$100 higher the following year. The depression began to be felt in the rural areas in 1930 as prices received for farm products began to drop and continued to drop throughout the year. There was no strengthening of the market in the years to follow until 1933 when prices recovered slightly. Not only was the farmer hit by a depression but also by a severe drought during the years 1931-37.

With a downward trend in prices and production per cow falling, total dairy sales dropped sharply between 1929 and 1936. The drought was so severe that hay land was pastured to provide summer grazing. This in time reduced feed available for the winter months to only part of the required amount (Table 11).

Table 11. Dairy Sales of the Case Farm, 1928-37

Year	Av. No. Cows Milked	Pounds Butterfat Per Cow	Total Pounds Butterfat	Price a/	Sales b/
1928	12	170	2041	.50	987.-
1929	12	195	2340	.48	1089.-
1930	11	197	2165	.37	779.-
1931	10	134	1344	.27	345.-
1932	8	130	1046	.18	186.-
1933	8	121	959	.19	180.-
1934	8	70	562	.23	170.-
1935	4	124	505	.26	144.-
1936	3	100	302	.32	94.-
1937	4	115	461	.32	147.-

a/ Yearly average of price received on farm.

b/ Includes butterfat, butter, and cream sales.

The Federal government began buying cattle in 1934, in order to decrease the supply available for the market and to cut down the number to be fed on short feed supplies. The number of all cattle dropped from 49 head at the end of 1933 to 29 head at the end of 1934. Part of the herd was sold in 1935 even though it was a fair crop year. The total

digestible nutrients of crops raised fluctuated very much during the early thirties and this short feed supply was reflected in the production of butterfat per cow. Grain sales amounted to a small percent of the income after 1928. The only grain sold during the early thirties was seed grain to other farmers (Table 12).

The decision to change from dairy to beef production took place in 1936. Total dairy sales were down since production per cow and price of butterfat was low. Very little feed grain was raised, decreasing the amount of grain available for dairy cattle rations. Pasture could be rented for \$25 per quarter which seemed a reasonable price. The cattle could be pastured approximately six months with little or no grain in their rations. With pasture available for rent the hay land would no longer have to be pastured, but used for hay production.

The labor force would not have been adequate to handle both the dairy herd and small grain farm after 1934. In 1930, two quarters of land were bought and rented out and after several years of poor crops, the tenant reduced scale of operations. The owner had to farm the land himself or let it lie idle. The addition of 320 more acres in 1934 decreased the amount of labor available for dairy production. Again, in 1935, more land was turned back to the owner and this increase in crop land decreased the amount of labor available for livestock production. The drought forced the operator to increase acreage of land farmed. The increased acreage occurred when the government bought part of the cattle and the following year when part of the herd was sold. The increased acreage could be handled with the cattle on pasture, during the months when grain farming required the available labor supply.

Table 12. Livestock Numbers; Feed Production and Sales on Case Farm, 1928-37

Year	Number Dairy Cattle	Number Beef Cows	Number Other Cattle	Total Cattle	Crop Acres	Pasture Acres	Hay Acres	T.D.N. g/ of Crops Produced	Dollar Value of Crops Produced	Dollar Sale of Crops
1928	19	—	23	42	370	160	125	226,950	2,656	2,089
1929	17	—	27	44	345	160	125	224,628	3,362	681
1930	16	—	29	45	350	160	125	305,678	3,312	272
1931	22	—	25	47	360	160	150	102,038	623	262
1932	18	—	29	47	350	160	135	418,019	1,534	377
1933	17	—	32	49	330	160	125	46,158	196	113
1934	7	—	22	29	547	250	79	6,540	39	208
1935	11	—	9	20	646	250	120	205,252	1,492	219
1936	3	11	15	29	576	250	135	484	11	1
1937	5	10	25	40	509	410	135	136,043	756	—

a/ Appendix B, Table 3.

Four factors were very influential in prompting the operator to change. First, the price of butterfat was very low; second, production per cow was decreasing since little or no feed could be raised; third, pasture could be rented at what seemed a reasonable price; and fourth, the addition of more crop land reduced the labor available for dairy production. 1/

Weather and prices were either directly or indirectly responsible for the change from dairy to beef production. If all the factors are considered together, the decision to change can be more easily understood.

Growth of Beef Enterprise.—After the change from dairy to beef production, the operator continued to expand the beef enterprise over the period studied. The total number of cattle increased from 29 head in 1936 to 311 head in 1951. The expansion in beef occurred each year as heifers were held for breeding stock. The only major cash expense in beef cattle was for bulls. The expansion was slow since breeding stock was not purchased and it took two years or more before the heifer calves were producing.

The problem of feed for the stock was eased after the change to beef. Not as much grain was required in the rations since beef cattle could be wintered on more roughage and less grain than dairy cattle. Production of roughage increased in 1938 with more acres planted to corn and cane fodder. 2/ There was enough winter feed produced after 1937 to carry the herd over until spring pastures were available. With plenty

1/ Appendix B, Table 4.

2/ Appendix B, Table 5.

of pasture available the problem of feed was overcome until the late forties when pasture became scarce. Weather was more favorable for crop production and the quantity of feed raised increased each year. There was no shortage of feed after the change to beef as had been the case in the early thirties.

The labor supply was not a limiting factor on the size of the beef enterprise. An adequate labor force was always on the farm, but summer pasture was a limiting factor on size of herd. In 1946, part of the cows were put on shares to cut down the number on summer pasture. This helped to solve the problem only temporarily since the herd was still increasing, but at a much slower rate. The practice of letting cattle out on shares was curtailed some in 1951. The reason for this was the poor return of calves and the death loss of cows that partners in the share agreement were experiencing (Table 13).

The expansion in beef proved very profitable because of rising trend in beef cattle price. Dollar sales of cattle increased each year except in 1948 when the cattle were held over and sold in 1949. There was an increase in number for sale each year along with an increase in price. After 1947, the number sold remained relatively stable and higher beef cattle prices account for the large dollar sales. The dollar inventory value of cattle was held constant after 1944, so that the increase in number could be shown. For example, dairy and beef cow prices were held at \$50 per head during the period.

The area in which the operator was located was favorable for beef production. There was adequate grazing land and native hay for feed. Expansion

Table 13. Expansion Beef Enterprise on Case Farm, 1936-51

Year	Number Beef Cows	Number Other Cattle	Cattle on Shares	On Farm End of Year a/	Cattle Price	Dollar Value of Cattle Sales	Cattle Price g/	End Year Inventory of Cattle d/
1936	11	15	—	29	4.70	116	5.45	880
1937	10	25	—	40	7.10	53	5.87	1,230
1938	15	23	—	41	7.00	513	7.44	1,360
1939	20	30	—	53	7.60	607	8.42	1,610
1940	24	42	—	70	8.00	407	8.84	2,125
1941	31	53	—	90	9.00	844	10.27	2,710
1942	43	80	—	129	11.30	888	12.07	3,835
1943	45	93	—	146	12.30	2,187	13.14	4,535
1944	69	118	—	195	11.40	2,566	12.09	7,780
1945	70	136	—	214	12.50	3,271	12.99	8,610
1946	122	142	10	252	15.20	3,047	15.04	10,460
1947	127	164	68	299	19.50	10,075	19.89	12,610
1948	120	171	50	295	22.80	2,936	24.90	12,340
1949	135	156	75	293	20.00	28,961	22.48	12,350
1950	142	142	72	287	23.90	17,742	26.93	12,180
1951	136	172	15	311	29.70	17,864	23.15	13,100

a/ Includes dairy cows.

b/ Includes all types and trades of Beef Cattle. Average price received by South Dakota farmers as reported by South Dakota Crop and Livestock Reporting Service, 1952.

c/ Price of Feeder and Stocker cattle at Omaha. Good steers: 500-800 pounds.

d/ Dollar value of cattle for inventory purposes held constant since 1944.

of dairy cattle could not have been as great with the labor supply and buildings as they were. Another factor which contributed to the growth of the beef enterprise was the operator's interest in beef cattle.

Expansion in beef cannot be attributed to one factor but rather a combination of several. The price level of beef, production of winter feed, adequate pasture, and the operator's interest in beef all influenced management's decision to expand beef production.

Hog Enterprise.—The size of the hog enterprise fluctuated over the entire period studied and no set pattern can be found in its movement. The influence of the price of live pork can be seen in the number of sows farrowing. As the price of pork decreased, the number of sows farrowed decreased. The labor available for pork production determined to a degree the number of sows farrowed. The price of feed fed to the hogs was a determining factor in number of litters raised.

In 1928, the farm was operated as a dairy-hog farm. The feed raised was fed to the livestock and either the livestock or livestock products were marketed. The hog enterprise expanded during the period 1928 to 1931, with the number of sows farrowing increasing from 14 head to 31 head. Hog sales increased each year until 1931 when the price dropped more than three dollars per hundred weight. The number of hogs marketed was the largest, but with the price much lower, total sales were down 50 percent. With the production of feed down in 1931 (Table 12, Column 8) and the price so low, pork production dropped considerably in 1932. Even though the total digestible nutrients of feed raised increased in 1932, the low price paid for hogs in 1933 held production at the 1932 level (Table 14).

Table 14. Hog Enterprise on Case Area, 1928-51

Year	Sows Farrowed	Pigs Raised	Corn-Hog Ratio	Price of Hogs Cwt. a/	Dollar Hog Sales
1928	14	73	11.8	8.48	800
1929	20	95	12.6	9.20	2000
1930	31	155	14.1	8.50	2819
1931	31	239	13.4	5.30	1414
1932	16	79	13.6	2.85	279
1933	15	45	13.2	3.15	538
1934	6	42	6.8	3.70	356
1935	9	51	12.4	8.10	536
1936	21	107	14.6	8.90	1239
1937	11	82	11.6	9.10	620
1938	10	42	18.6	7.40	564
1939	14	64	16.1	5.70	707
1940	8	50	10.8	5.10	563
1941	13	— ^{b/}	17.1	9.00	1711
1942	28	175	18.1	12.80	4481
1943	33	204	16.0	13.50	7985
1944	13	86	13.4	13.00	9513
1945	12	70	15.3	13.80	4868
1946	8	20	14.0	16.80	3341
1947	7	44	15.0	23.50	4343
1948	8	45	13.9	22.50	4520
1949	12	74	17.0	17.20	2184
1950	27	70	14.9	17.30	4684
1951	10	50	13.8	19.20	2964

a/ Average price received by South Dakota farmers as reported in South Dakota Crop and Livestock Reporting Service, 1952.

b/ Not available.

The hog allotment program, put into effect in 1934 by the Federal Government, was a voluntary program on the part of the producer. This hog allotment was based on the number of sows farrowed in preceding years. The operator participated in the program and since production had already been cut in 1932 and 1933, the quota received in 1934 was considerably lower than any previous year. The cut in production in 1934 and again in 1935 was due to the low hog base under the program.

With a relaxation of the allotment in 1936 accompanied by a favorable price, the number of sows farrowed increased. The production of feed grains dropped to zero in 1936 because of the drought, necessitating a cash expense of 654 dollars for feed. Almost all the feed bought went to the hog enterprise since the shift from dairy to beef took place the same year. The following year saw a decrease in the number of sows farrowed and hogs raised.

The reason for a cut in number of sows farrowed in 1937 was the poor crop year in 1936. Even though price was somewhat higher, production could not be increased since feed was not available.

When the change to beef production was contemplated the operator realized the income from cattle would be small because of the time it took to increase cattle numbers. Therefore, hog production expanded to serve as the principal source of income while the cattle herd was being built up. The number of sows farrowed, after the change to beef until 1941, was largely determined by the feed available and price. Crop production was more favorable, but yields were not back to average during this period. Roughage was the primary cattle feed so the feed grains which were produced could be fed to the hogs.

Pork production again increased when the threat of war became more apparent in 1941. The price of pork was rising and at the same time crop production was increasing. With world demand for food products so high, the Federal Government emphasized all-out production from the American farmer. This was the incentive for many producers to expand their production. The number of sows farrowed on the case farm went to

an all-time high of 33 head in 1943. There was a cut in number of sows farrowed in 1944 and 1945, but feeder pigs were purchased which resulted in total hog sales for 1944 increasing five times over the 1941 level.

Ground barley was the principal feed used in hog production during the early forties. The operator expanded barley acreage in 1939, 1940, and 1941. Barley, at this time, was yielding more bushels per acre than corn and the price was about 25 percent cheaper per bushel. ^{3/} Pigs fed ground barley required somewhat more feed per 100 pounds gain since the feed value of ground barley is 91 percent as much as corn per ton. ^{4/} The production of barley for feed was greater than the amount needed, but the surplus was not sold, rather stored for future use. The operator expected that if the ~~United~~ ^{United} States became involved in the war, prices would rise.

The cut back in hog production in 1944 and 1945 can best be explained in relation to the available labor and beef cattle numbers. At this time the number of beef cattle had increased to approximately 200 head. The labor required for the cattle enterprise decreased, the labor supply available for pork production. Beef cattle is what the operator wanted to expand and in order to expand, a cut in the production of some other enterprise was necessary. With sows farrowing about the time cows are calving, it was necessary to cut out one of the two. With the operator's interest in the beef enterprise a cut in pork production resulted.

The production of pork was relatively constant from 1946 to 1950. Even though the price of hogs was rising, it was not possible to expand

^{3/} Table 15, p. 37.

^{4/} Frank B. Morrison, Feeds and Feeding, the Morrison Publishing Company, Ithaca, 1949, p. 307.

and sell on the rising market. Labor was a limiting factor in the production of pork at this time. Any increase in the hog enterprise would result in poorer husbandry of the cattle. Labor requirements on beef were about equal to total labor supply available for livestock. Production of pork increased in 1950, largely due to the labor supply. Hired help had been part of the labor force for many years; and in 1950, the hired help was interested in hogs. The operator let the hired man raise hogs on a share basis, thus accounting for the large increase in number of sows farrowed. In 1951, the hog house burned down and pork production was cut. Without adequate housing the profitability of hog raising was lessened and a cut in production resulted.

Hog production appears to have been influenced by price of pork, government's demand for food, cost of feed, inventory of feed, available labor, and the operator's expectations. As one or more of these factors tended to make more production possible as well as profitable, production was increased. It appears that there are other factors more influential than the corn-hog ratio which determined the rate of farrowing on the case farm. There was no growth or increase in hog production comparable to beef production, but rather a fluctuating production responding to one or more of the six factors listed.

From this study it becomes evident that management's decisions were based in part on weather and cost-price ratios. Shifts in the livestock enterprises are quite evident in response to changes in the weather and cost-price ratios. Weather determined crop production which in turn influenced dairy and hog production. Farmers do change production as weather and price conditions shift.

The movements of production, weather, and price need not be similar, but are often in opposite direction. For example, in 1936 hog production increased while the total digestible nutrients of feed raised dropped almost to zero. The influence of price caused production to increase; at the same time, crop production was expected to be normal, but this did not prove to be the case since hog production increased and feed production went to an all-time low. Feed production was not known when the decision was made to increase number of sows farrowed. The decision of management to shift production is based on several factors and each plays an important part in the final analysis.

Grain Enterprise

This section will explain changes in the small grain and row crop enterprise. If there was a large change in acreage seeded from one year to the next, on what did management base its decision to increase or decrease acreage? Was it price received, feed requirements, or yield expectations that determined the acreage planted or a combination of these and other factors?

Small Grain and Row Crop.—Central South Dakota is primarily a wheat and grazing area. There are other ~~crops~~ raised, but the climate and soil are not as well adapted to other grains as to wheat. While there is a diversification in central South Dakota, the emphasis is on wheat production. Wheat as the major crop can best be explained in terms of the Principle of Comparative Advantage, which states, "that a product tends to be produced in those areas where its ratio of advantage over other areas is higher, or its disadvantage is lower than for any other product." 5/

5/ J. D. Black and others, Farm Management, The Macmillan Company, New York, 1949, p. 376.

It is possible for an area to produce more than one crop under the principle of comparative advantage. Complementary and supplementary relationships in the grain enterprise are evidenced in the cropping system followed on the case farm. The cropping system followed is not one of all wheat; rather several crops are produced. Labor is utilized during the summer months in crop production whereas if wheat were the only crop produced, labor would be idle between seeding and harvest time.

The area is adapted to grazing of cattle since a high proportion of the land is adapted to range pasture production because of soil type and topography. The land in crop production is used for raising of feed grains and roughages which are fed to the livestock during the winter.

The farm operations in 1928 were centered around dairy and hog production with the feed raised fed to the livestock. Corn, oats, and barley were the major feed grains raised in quantity with wheat the cash crop. There was a small acreage in ~~corn~~ and corn fodder which were used for feed.

Since the farm was a dairy-hog farm, the production of wheat as a cash crop was secondary to the production of enough feed. At the same time to reduce risk by diversification, some wheat was raised to supplement the sale of livestock and livestock products. The acreage sown to the three feed crops, corn, oats, and barley, increased some as the depression and drought became more severe. To compensate for the low yield, more acres were planted in an attempt to keep production of feed up to a minimum level. See Table 2.

The operator purchased two quarters of land in 1930 which were rented out. The tenant wanted to produce wheat and the operator discontinued

raising it. Wheat production on the land rented out was to provide enough wheat to fill us a cash crop but this did not materialize because of the depression and drought in the thirties. The drought reduced wheat from production about 50 percent in 1934. There was little wheat to sell as a cash crop even the rented land in the years to follow.

A wheat acreage allotment program set up by the Department of Agriculture was put into practice in 1934. The acres planted depended on the amount raised previously. No wheat had been raised on the farm since 1930; therefore, no acreage allotment was expected. The tenant who had been renting the two quarters decided to remove some of operations in 1934. The operation would then be two quarters and probably a wheat base on the land would be left idle. What was as profitable a crop to raise as any, so the decision was made to raise the land and receive a wheat acreage base (Table 15).

Average of crops planted diversified as the need for food varied. With crop yields very low, increased acreage was one method of solving the food problem. The Ukrainian crop duty to New had some effect on the cropping system. There was an increase in corn and some fodder average as corn yields were needed for food during the winter months average forage was substituted for corn in the ration for beef cattle.

Wheat acreage decreased prior to the war and during the war. This increase in acreage was due to several factors. Threat of global war was becoming more real and world demand for American food was increasing. The expansion broadens the experience of United States enter into a war. The prices for both grain and livestock was expected to increase. At the same time, outlook for crop production is more favorable. The

Table 15. The Four Basic Crops Raised - Acreage - Yield - Price of Each for Farm Studied, 1928-51 ^{a/}

	Wheat Acreage	Wheat Yield	Wheat : Price	Corn Acreage	Corn Yield	Corn : Price	Oat Acreage	Oat Yield	Oat : Price	Barley Acreage	Barley Yield	Barley Price
1928	90	5	1.03	130	14	.72	45	28	.40	35	14	.62
1929	70	10	.96	90	16	.73	60	25	.24	40	15	.48
1930			.56	120	13	.47	60	25	.24	90	22	.33
1931			.44	65	2	.31	30	0	.20	80	15	.27
1932			.34	130	20	.25	40	31	.10	85	22	.16
1933			.69	70	0	.47	40	0	.30	100	0	.39
1934	125	0	.92	120	0	.84	95	0	.51	50	0	.70
1935	180	2	.89	80	10	.50	65	9	.20	190	3	.30
1936	130	0	1.16	140	0	1.08	60	0	.40	70	0	.67
1937	100	0	.96	130	4	.44	50	0	.24	60	10	.41
1938	117	3	.54	126	5	.44	27	20	.17	64	11	.29
1939	125	2	.70	68	1	.51	54	1	.25	122	4	.34
1940	176	6	.68	160	10	.53	40	12	.22	200	10	.35
1941	175	14	.94	160	7	.65	80	36	.34	210	27	.51
1942	155	20	1.07	160	25	.75	100	42	.40	165	30	.59
1943	175	7	1.34	190	11	.98	160	25	.64	150	12	.99
1944	183	10	1.39	215	28	.89	104	36	.59	207	9	.98
1945	171	23	1.51	230	18	1.10	190	42	.57	50	26	1.03
1946	180	19	1.97	285	21	1.41	120	30	.72	90	26	1.39
1947	150	15	2.39	200	7	2.04	225	31	1.01	160	12	1.92
1948	215	12	1.97	220	22	1.24	190	30	.62	155	10	1.05
1949	220	10	1.94	230	12	1.18	190	35	.58	35	20	1.01
1950	207	10	2.03	260	25	1.37	200	25	.71	30	25	1.17
1951	341	18	2.11	100	15	1.23	170	30	.73	28	21	1.06

^{a/} Price of wheat, corn, oats, and barley taken from South Dakota Crop and Livestock Reporting Service Annual Report, 1949, 1952.

operator anticipated crop yields in the future to be normal or above average. Barley was outyielding corn prior to the war, and when ground was an excellent hog feed.

Cost of barley as a hog feed was much cheaper per bushel than corn. Future needs were what the operator considered along with the present demand for hog feed. With storage space available on the farm, a large acreage of barley was seeded each year from 1939 to 1944. When the Federal Government requested greater production of pork from the American farmer, expansion was possible with a cheap feed available on the farm.

Expansion of corn and oats production accompanied the expansion in barley, but for other reasons. With cattle numbers increasing, more grain was needed for feed than had been the case before the war. After 1945, the cattle enterprise had about reached its limit as to expansion. The cattle numbered approximately 280 head and required considerable grain in their feed rations. The young stock was fed oats while steers in the feed lot were fed corn. From 10 to 40 head of steers were fattened for market each year after the war.

Price of feed grains were raised to new levels by the post war inflation. ^{6/} Before 1941, it had been profitable to market the grain in the form of livestock or livestock products, and after 1945, it became profitable to sell the grain and disband feeding operations. Crop yields were above average after World War II permitting part of the crop to be sold at the high price.

^{6/} Table 15, p. 37.

The production of a second cash crop did not begin until 1944 when flax was seeded. Some flax had been seeded in 1941, which was not harvested. Flax as a second cash crop did not become important in terms of acreage or dollar return until 1946. The large acreage sown to flax in 1946 and 1947 was due to the high market price of flax. Crop yields for the past few years had been normal or above which were considered by the operator when planning flax in the cropping system. As new varieties of flax are developed which are adapted to the soil and climate of central South Dakota, flax may become an important cash crop for many grain farmers (Table 16).

Table 16. Flax - Acres Planted - Yield - Price for Case Farm, 1941-51

Year	Acres Sown	Yield	Price Per Bushel a/
1941	30	0	1.77
1942	—	—	2.32
1943	—	—	2.80
1944	28	6	2.87
1945	—	—	2.88
1946	89	10	4.09
1947	110	6	6.00
1948	42	10	5.64
1949	35	3	3.61
1950	50	10	3.37
1951	58	12	3.61

a/ Sources: South Dakota Crop and Livestock Reporting Service Annual Report, 1952.

The expansion in acres of cultivated crops in 1940 and after the war was made possible by mechanization of the farm. The addition of large units of power machinery is possible on large scale operations. The resource utilization is much more efficient on the large scale farm than small scale farm if the inputs of power machinery are large. In the case of the operator

machinery inputs were large, and this permitted more efficient use of the machinery and labor force. There was an increase of 1.1 man workers during this period accompanying a 444 acre increase in cropland and a 258 head increase in cattle numbers. Labor efficiency increased with the use of power machinery since work units per man increased from 312 in 1939 to 483 in 1951. ^{7/} Two studies made in central South Dakota, one in 1932 by Hampson and Christopherson and the other in 1951 by Ulvilden, on rates of performance of various types of machinery point out the decrease in man hours per acre of crop land with the use of machinery. ^{8/} Man hours per acre will decrease as new methods and machinery adapted for this area are put into use.

The end of the year inventory value of power and crop and general machinery is listed in Table 17. The cost of replacing machinery after 1945 was much higher than in previous years. There was an increase in quantity of machinery after 1940 and part of the high inventory valuation is due to this increase in quantity and part to high replacement cost. Part of a new line of crop machinery was purchased in 1950 accounting for the high inventory of crop and general machinery at the end of that year.

Summary of Grain Enterprise.--In summarizing the grain enterprise, not one but several factors influenced the operator's decision to expand or

^{7/} Appendix B, Table 6.

^{8/} Hampson, C. M. and Paul Christopherson, Tractor and Horse Power in the Wheat Area of South Dakota, South Dakota Agriculture Experiment Station Circular 6, BAE, USDA, Cooperating, 1932.

James Ulvilden, Farm Labor Power and Machinery Performance for Selected Operations Under Dryland and Irrigated Conditions in Central South Dakota, South Dakota Agricultural Experiment Station, Agricultural Economics Pamphlet 43, 1953.

Table 17. Grain Enterprise and Mechanization on Case Farm, 1928-51

Year	Crop Acres ^{a/}	Dollar Value of Production ^{b/}	Dollar Sale of Crops	End of Year Inventory Power Machinery	End of Year Inventory Crop & General Machinery
1928	370	1,656	2,089	20	2,356
1929	345	3,262	681	15	1,988
1930	350	3,112	272	10	1,660
1931	360	623	266	5	1,428
1932	350	1,534	397	—	1,110
1933	330	196	113	—	956
1934	547	39	208	85	920
1935	646	1,492	219	215	879
1936	576	11	1	125	809
1937	509	756	—	69	776
1938	539	853	—	842	698
1939	597	609	4	777	655
1940	852	2,312	399	642	600
1941	802	6,200	1,970	1,302	1,322
1942	802	7,127	1,046	1,756	1,886
1943	909	8,715	2,413	1,715	2,026
1944	852	12,172	6,036	1,448	2,759
1945	836	18,733	7,998	1,186	2,488
1946	882	22,891	12,240	1,135	2,359
1947	926	24,262	18,138	5,555	3,863
1948	975	23,194	28,294	8,058	6,900
1949	980	11,506	9,590	9,087	7,608
1950	1,027	21,613	7,601	8,933	13,535
1951	1,041	24,624	9,587	10,483	13,532

^{a/} Includes small grain, row crop, tame hay.

^{b/} The current value was assigned cash crop produced including native hay.

decrease crop acreage. The first and probably most important is that the grain enterprise is secondary to the livestock enterprise. The feed requirements for the livestock determined to a degree acreage sown to feed grains. Wheat and later flax were raised as a cash crop to supplement income from livestock. Secondly, mechanization made it possible to expand in cattle and grain with about the same labor supply. Much of the machinery used for grain farming could be used on the livestock enterprise reducing the time spent on livestock chores. Thirdly, the price of all grains was high after the war and it became profitable to sell part of the crop since yields were above average at this time. Fourth, future price expectations of grain and livestock appeared more favorable than they had been during the thirties; and last, there was rainfall of normal or above average amounts from 1941 on.

In analyzing the grain enterprise of the farm, it is important to consider the impact of new crop varieties and hybrid corns. At the same time, more emphasis was put on soil conservation practices by the Federal Government in its farm program. The same acreage of land with modern farming practices and crop varieties adapted for the area will produce more bushels with normal amount of rainfall than previously under the old methods, varieties and horse power. As changes in technology take place in the future, the productiveness of the land will increase as the new methods and varieties are used.

Income and Pasture Acreage in Relation to Livestock Enterprises

The requirements for hay and pasture are determined by the type and size livestock enterprises on the farm. In the case of the farm studied dairy cattle and later beef cattle determined the acreage needed of pasture

and hay land. The number of livestock on the farm, acres of pasture required per animal unit, and winter feeding program are all factors to be considered by management in planning the future pasture and hayland requirements.

Pasture and hay acreage were relatively stable during the period the operator was engaged in dairy production. Total number of livestock increased seven head between 1928 and 1933. Additional pasture was rented in 1934 since the drought of 1933 decreased the carrying capacity of pastures. Even with a decrease in number of cattle, the additional pasture was utilized since the drought continued in the area in 1934. In 1935, cattle numbers again decreased but the same amount of pasture was used as the carrying capacity was low. Hay acreage fluctuated slightly between 1928 and 1935, while the acreage sown to corn or cane fodder fluctuated much more during the same period. The need for additional roughage for wintering the livestock was felt during the drought years when native and tame hay yields were low. 9/

Production of feed grains to be used in rations for the dairy cattle was low and more roughage had to be fed during the early thirties. Roughages consisted of native hay, tame hay, corn or cane fodder, and oats or barley cut for hay if the growing season was too hot or dry for it to mature.

The change in 1936 to beef production required more acres of pasture since the cattle would be on pasture all summer and receive little grain. Pasture acreage increased with the growth of beef enterprise. Even though the number of cattle did not increase so rapidly more acres per animal unit

9/ Appendix B, Table 4.

were required as the carrying capacity of a pasture was so low. 10/ The acres of pasture required per animal unit decreased after 1940 because rainfall was above average during the growing season. Cattle numbers doubled between 1943 and 1951 while pasture acreage increased 140 acres during the same period. Since 1941, the weather has been favorable for five to seven months of summer grazing (Table 18).

Following the war, part of the breeding stock was put out on share agreements with other farmers. The reason for this was a reverse in conditions in regard to available pasture. No longer were cattle numbers influencing the amount of pasture needed, but pasture acreage was now influencing some of the livestock enterprises. When the change to beef was made there was pasture available for rent or purchase, but after 1946 there was little pasture available for rent or purchase. More pasture was needed in 1951 than most of the cattle on shares were brought home.

The acreage of corn or other fodder increased after the change to beef production. More roughage was needed for winter feed as less grain was included in the beef cattle rations. With the increase in cattle number each year, more roughage was needed as hay production was down because of the drought, and in 1938, all the native hay land was pastured during the summer months. In an attempt to carry some roughage over each year in case the drought occurred in the future, acreage of corn and other fodders almost doubled in 1939. To have part of a year's requirements of feed carried over each year was one way of preventing a serious liquidation in cattle numbers. In 1934 and 1935, part of the cattle were sold since no

10/ Aaron G. Nelson, and Gerald E. Koran, Should Farmers Emphasize Wheat or Livestock in North Central South Dakota, South Dakota Agricultural Experiment Station Circular 33, June 1941, p. 15.

Table 18. Pasture and Hay Acreage in Relation to Cattle Numbers on Cane Farm, 1928-51

Year	Dairy Cattle	Beef Cattle	Total Cattle	Pasture		Native Hay		Tame Hay		Corn or Cane Fodder Acreage	
				Acreage	Average	Acreage	Average	Acreage	Average	Acreage	Average
1928	19	—	42	160	—	100	—	25	—	30	—
1929	17	—	44	160	—	100	—	25	—	30	—
1930	16	—	45	160	—	110	—	15	—	35	—
1931	22	—	47	160	—	110	—	40	—	85	—
1932	18	—	47	160	—	110	—	25	—	30	—
1933	17	—	49	160	—	110	—	15	—	75	—
1934	7	—	29	250	—	64	—	15	—	a/ 70	—
1935	11	—	20	250	—	105	—	15	—	—	—
1936	3	26	29	250	—	120	—	15	—	—	—
1937	5	35	40	410	—	135	—	—	—	—	—
1938	3	38	41	647	—	b/ 70	—	—	—	85	—
1939	3	50	53	590	—	—	—	—	—	151	—
1940	4	66	70	624	—	105	—	15	—	145	—
1941	6	84	90	700	—	120	—	—	—	160	—
1942	6	123	129	800	—	160	—	44	—	190	—
1943	8	198	146	900	—	100	—	74	—	20	—
1944	8	187	195	900	—	95	—	—	—	49	—
1945	8	206	214	900	—	100	—	25	—	10	—
1946	8	244	252	1020	—	120	—	93	—	25	—
1947	8	291	299	983	—	120	—	63	—	—	—
1948	4	291	295	983	—	160	—	100	—	—	—
1949	2	291	293	900	—	130	—	180	—	—	—
1950	3	284	287	1060	—	130	—	200	—	—	—
1951	3	308	311	1040	—	130	—	202	—	40	—

a/ Part of corn cut for fodder.
 b/ Pastured during summer months.

feed was available and the operator did not want to experience that situation in the future. As the yield of native and tame hay increased, corn and cane fodder acreage decreased after 1942 as enough feed was produced without a large acreage planted to fodder. ^{11/}

There was a small acreage of tame hay harvested every year until 1937. In 1940, 15 acres of tame hay were harvested and the following year no tame hay was harvested. Alfalfa was seeded in 1941 and harvested in 1942 as hay with an increase in acres seeded the same year. The acres of alfalfa for hay increased every year after 1945 as the expansion was based on two factors: (1) alfalfa is an excellent winter feed; and (2) it has soil building properties. Morrison states in Feeds and Feeding:

"Alfalfa provides over three times as much digestible protein per acre as clover and timothy hay and 2.4 times as much as corn grown for silage. It furnishes nearly twice as much digestible nutrients per acre as does clover and timothy hay, and is excelled only by corn silage. In addition, alfalfa hay is much richer in calcium and also higher in carotene and other vitamins than are these other crops." ^{12/}

The operator realized this value of alfalfa for a winter feed and expanded the acreage to the present level.

Summary of Forage and Pasture Acreage.—The expansion of pasture and hay acreages was directly related to the expansion in the beef enterprise. Sale of hay was not as profitable as sale of grain, and no surplus was harvested to be sold. The acreage of hay depended upon the feed requirements for wintering the stock.

During the early thirties when hay land was fenced and pastured, fodder was the principle winter roughage. As weather conditions became more favorable for increasing the carrying capacity of a pasture, and hay production

^{11/} Appendix B, Table 5.

^{12/} Frank B. Morrison, Feeds and Feeding, The Morrison Publishing Company, Ithaca, Abridged 1949, p. 214.

increased, the need for a large acreage of fodder lessened. At the same time acreage for alfalfa was increasing, thus providing part of the winter roughage for cattle.

Since beef production was what the operator was interested in, the acreage of hay, pasture, and feed grains were in part, determined by the size of the herd. The income of the farm was based on the beef enterprise and to make a profit on the beef, adequate pasture and feed were required. If the sale of grain was the primary source of income, there would not have been the expansion in cattle numbers or pasture and hay acreage. The expansion in total acres might have taken place but in the form of more wheat sown. Since cattle were the primary source of income, the other enterprises were built around it.

CHAPTER V

SUMMARY AND CONCLUSIONS

This study on changes in farm organization in response to changes in weather and cost-price ratios, showed that the operator did change organization of the farm as these two variables changed. The change from dairy to beef was the result of changes in weather and prices. The other changes in organization were not influenced nearly as much by weather and cost-price ratios as originally hypothesized. The effects of future changes in weather and cost-price ratios were considered by the operator in making changes in the various enterprises. While weather and cost-price ratios were analyzed in detail, the study revealed other aspects of management which were much more influential in determining changes made in the farm organization.

With dairy production as one of the major sources of income, the inflexibility of farm operations was realized by the operator when low prices and drought conditions existed. Hog sales was the other major source of income. These two enterprises were competitive for the feed grains produced and when total digestible nutrients produced on the farm were low, either or both the enterprises were affected. Production of either dairy products or hogs had to be reduced when the amount of feed grains produced on the farm was below the minimum requirements of the live-stock enterprises unless feed was purchased. Farm income was low due to depressed prices and was expected to decrease more if it became necessary to cut production in either or both the major sources of income. 1/ Cash operating and family living expenses were larger than income in some years, but the difference was made up from capital in reserve the operator had

1/ Appendix B, Table 7.

accumulated before the drought and depression years. The operation of the farm could not go on indefinitely under these conditions because the farm operated in this way was not a profitable business.

The flexibility of the livestock enterprise after the change to beef and long range planning was considered by the operator when the change to beef was contemplated. The feed grains produced could be fed to the hog enterprise since cattle rations were primarily roughages. In this manner, income would not have to drop as hog sales could be increased during the period when very little cattle sales were anticipated. The farm operations were more flexible with beef and hogs, since the hog enterprise could be expanded rather fast when feed was available as beef and hogs were not so competitive for the feed grains. If crop production was poor the hog enterprise could be cut back rather quickly. Small grains that did not mature or were too poor to harvest could be put up for hay and fed to the cattle. The sale of cattle was primarily yearlings which added much to the flexibility of the beef enterprise. If liquidation of the cattle herd was necessary because of low feed supplies, the calves could be sold and the breeding herd held intact. Three changes were made by the operator which indicate good management of a farm in the north central area of South Dakota; namely: (1) a change from dairy-hog production to beef-hog production; (2) production of pork which could be increased or decreased rather quickly as feed inventories permitted; (3) market yearlings instead of calves as the farm is not located in a feeding area.

The expectations of the operator as to what would happen in the future and how that in turn would affect farm operations were an important influence as to changes made in farm organization. Planning part of the

farm operations on expectations can be risky from the income side of the farm business. If events do not happen as expected, income could fall to a precarious level endangering the whole farm business. Planning by the operator in respect to his expectations was done in a manner that would permit him other alternatives if events did not happen as expected. For example, if hog production had not been expanded, the barley in storage could be sold. The only loss that would be encountered by selling the barley would be the difference in price at time of production and time sold plus the loss of grain in storage and storage costs. There was always the possibility that prices might rise and income would increase due to higher grain prices.

Changes made in farm organization might have been different if the operator had to provide for a family. Since the operator was a bachelor, family living expenses were held at a minimum and not expected to increase in the future. It was not necessary for the operator to reserve as much of the farm earnings for family living as it would have been if he had a family; consequently, farm reorganization could be more readily undertaken.

The study brought out the effective use of labor on the farm after 1939. Labor costs were held at a minimum while machinery was substituted for labor. Hired help became a regular part of the labor force in 1940. Investment in machinery was high but the size of the farm business was large and machinery could be easily substituted for labor. Much of the machinery purchased for the grain enterprise could be utilized on the livestock enterprise.

The cropping system followed was not a soil depleting system of seeding wheat on the same land year after year. Rather a cropping system

was followed whereby moisture was conserved through summer fallowing, weeds were controlled by the use of row crops, and soil building forage crops were planted. Through experience gained by farming, work done by the Department of Agriculture and South Dakota Agricultural Experiment Station, improved cropping procedures were practiced by management in planning the cropping system.

This study showed that average yields for the case farm of the four major crops raised varied only slightly over the long period from the county average. Yields on the case farm for each crop did vary much more between years and within the year from the county average yield. The production of feed on an individual farm may vary considerably from the county average within a year, but over a long period, the county yield in terms of production per acre will represent a reasonably true picture of production that can be expected from a typical farm within the county.

Previous studies made in central South Dakota, as published by the South Dakota Agricultural Experiment Station, recommend various organizations for a farm in the area. While these studies were not directly concerned with Faulk County, the area covered included Faulk County in the 1941 study and is applicable to Faulk County in the 1940 study. The recommendations and conclusions for these two studies state:

- (1) If the price of wheat is not above that of feed grains, livestock production will be the more profitable regardless of wheat yields;
- 2/ (2) a combination of livestock enterprises with a relatively small acreage of wheat as a cash crop seems to offer the best long time possibility for a type of farm that can survive droughts and maintain a fairly stable farm income;

2/ Aaron G. Nelson and Gerald Korzan, Should Farmers Emphasize Wheat or Livestock in North Central South Dakota, South Dakota Agricultural Experiment Station Circular 33, 1941, p. 16.

(3) it seems logical to conclude that farm operators would benefit by adopting a policy of maintaining a one year reserve feed supply and limiting brood sows to the number of litters which could be fed out with grain actually in the bin; (4) rough-age-consuming livestock provide a market for native hay, pasture, and by-products such as straw and corn stalks. They also provide a means of securing some return from crops that are not good enough to harvest for grain. If properly handled, cattle provide a fairly regular income even in drought years. Flexibility in feed requirements also is provided by cattle, especially when dual purpose cows are kept. The breeding herd may be culled and steers disposed of in the event of feed shortage. 3/

While the changes in organization of the case farm after 1936 were very similar to the recommendations as set forth in these bulletins published by the South Dakota Agricultural Experiment Station, it is notable that some of the practices on the case farm were ahead of the publication of the bulletins. The above four recommendations and conclusions of the previous studies were put into practice on the farm studied. These recommendations and suggestions for farms in the North Central Area of South Dakota as emphasized by the two bulletins appear to be substantiated by this study.

In conclusion, the study revealed efficient management of the farm business. Adjustments were made in farm organization before the income squeeze was severe enough to force changes. It was not weather and cost-price ratios alone that determined the organization or changes made in organization of the farm. The expectations of the operator and long range planning were influential factors as brought out by this study. The operator's preference was an influential factor in considering changes in farm organization.

3/ James L. Paschall, Aaron G. Nelson, and Olav Rogeness, Planning Minimum Sized Farms for Beadle County Area in Central South Dakota, South Dakota Agricultural Experiment Station Bulletin 341, B.A.E., Cooperating 1940, pp. 24-31.

The study brought out the lack of information on capital structure of the operator and what influence that had on changes made in the farm business. Not one but several variables, those management has control over and those management has no control over, influence the decisions of the operator and many changes are interrelated as to the effect it will have on the other enterprises of the farm.

APPENDIX A

SOILS OF FAULK COUNTY, SOUTH DAKOTA 1/

Williams soils are found on the undulating Mankato glacial till plain. In a typical Williams profile, the surface horizon (layer) is a dark brown, non-calcareous loam which is about six to ten inches thick. The subsoil is a grayish-brown clay loam showing a distinct vertical prismatic structure. It extends to a depth of about fifteen inches. The parent material, a buff colored clay loam glacial till, is found below about fifteen inches. The upper six to ten inch layer of parent material is high in lime and is known as the zone of lime accumulation.

Zahl loam, which is found on the steeper slopes and is common on the small portion of Cary glacial till in the southwest corner of the county, has a much thinner profile than Williams. It may be calcareous (limy) to the surface.

Estevan silt loam occurs on many of the more level areas and in slight depressions in this section of the county. In a typical profile the upper four inches are a nearly black friable silt loam. Directly below this is a thin ashy gray layer which lies directly over a very compact, dark grayish-brown subsoil. This horizon has a vertical structure of columns about two inches thick with round gray coated tops which have the appearance of biscuits. This layer grades into the glacial till parent material at about twenty to twenty-four inches. Estevan soils form which are commonly known in the area as slick spots, gumbo, or biscuit top.

Stony and steeply sloping areas in the western portion of the county make some areas unsuitable for cultivation. They are utilized for grazing.

1/ R. I. Ries, Faulk County Agriculture, South Dakota Crop and Livestock Reporting Service, 1952, pp. 6-7.

The major portion of Williams soils are used for grain and diversified farming. Fair to good yields of small grain are obtained.

Aastad soils are similar to Barnes but are found on lower slopes and flatter areas. In these positions they receive considerably more moisture. Consequently, the surface horizons are nearly black and the dark color extends much deeper into the profile. The zone of lime accumulation is at about twenty to thirty inches. Aastad soils are only moderately well drained. Barnes and Aastad soils are utilized chiefly for growing small grains and corn. Yields are moderate to good. Steeper areas of Barnes soils should be returned to grazing lands because they are subject to erosion and in drier than normal years are drouthy.

Buse soils are thin, drouthy and often stony soils occurring on steeper slopes in close association with Barnes soils. They may be calcareous to the surface. They are not usually cultivated but are used chiefly for grazing. Their carrying capacity is limited.

The Beadle soils occupy large nearly level areas. They are somewhat similar to the Barnes soils but have a more compact subsoil and are underlain by a heavier textured clay loam till. The subsoils and parent material are olive brown in color and the latter has large splotches and streaks of free lime. Many boulders are found in Beadle soil areas. The soil is fairly productive when favorable moisture conditions exist. More areas are used for grazing purposes.

Turton soils are similar to Beadle but are developed from a heavy, plastic, clay till which contains much shale. They are only fairly productive at best and are relatively unimportant in the county.

Crestard soils are found in flat to slightly depressional areas. The surface horizon is usually about ten inches thick and has a noticeably gray color in contrast to soils of surrounding areas. The subsoil is similar to that of the Beadle soils. Where the surface horizon is thick the heavy subsoil is apt to cause drouthiness in dry years.

APPENDIX B

Table 1. Precipitation for Faulk County, County and Case Farm Yields, 1928-51

Year	Total : Rainfall :		Corn :		Wheat :		Oats :		Barley :	
	in. :	in. :	bu. :	bu. :	bu. :	bu. :	bu. :	bu. :	bu. :	bu. :
	Season a/ :	Season a/b/ :	County : Average c/ :	Case : Farm : Average c/ :	County : Average c/ :	Case : Farm : Average c/ :	County : Average c/ :	Case : Farm : Average c/ :	County : Average c/ :	Case : Farm : Average c/ :
1928	15.38	11.23	12	14	6	5	19	28	15	14
1929	14.90	6.01	11	16	8	10	14	25	9	15
1930	15.59	10.77	10	13	11	—	25	25	17	22
1931	12.51	6.34	2	2	3	—	6	0	8	15
1932	18.14	15.20	13	20	16	—	33	31	23	22
1933	13.54	9.78	.5	0	1	—	1	0	2	0
1934	9.64	4.58	.1	0	0	0	0	0	0	0
1935	18.04	15.11	12	10	5	2	25	9	14	3
1936	12.14	7.85	1	0	1	0	0	0	0	0
1937	14.27	10.28	4	4	2	0	4	0	6	5
1938	14.41	7.98	4	5	4	3	13	20	11	11
1939	13.44	8.37	5	1	5	2	15	1	11	4
1940	14.10	9.12	11	10	8	6	16	12	12	10
1941	21.84	14.51	6	7	11	14	29	36	21	27
1942	27.56	22.57	26	25	14	20	45	42	30	30
1943	17.33	12.35	14	11	7	7	26	25	12	12
1944	25.93	19.35	25	28	13	10	29	36	13	9
1945	17.77	12.63	17	18	16	23	39	42	24	26
1946	24.53	13.96	25	21	13	19	30	30	19	26
1947	19.47	12.19	12	7	13	15	29	31	18	12
1948	18.59	14.38	26	22	11	12	29	30	22	10
1949	18.52	10.60	11	12	7	10	16	35	11	20
1950	16.22	11.43	18	25	9	10	17	25	11	25
1951	19.81	13.30	17	15	14	18	35	30	22	21
Av.	17.24	11.66	11.7	11.9	8	9	20.5	20.9	13.7	13.7

a/ Sources: United States Department of Commerce, Climatological Data for South Dakota, 1928-1951.

b/ April through August.

c/ Source: Faulk County Agriculture, 1957.

Table 2. Dairy Sales of Case Farm, 1937-51

Year	Dollar Dairy Sales a/
1937	147
1938	141
1939	135
1940	180
1941	296
1942	314
1943	167
1944	186
1945	181
1946	233
1947	299
1948	—
1949	193
1950	258
1951	93

a/ Source: Farm Record Books of Case Farm.

Table 3. Table Used Figuring T.D.N. of Grain Produced a/

	T.D.N.	Pounds Per Bushel	Pounds T.D.N. Per Bushel		Percent T.D.N. Per Cwt.
Corn, Dent (Grade No. 4)	76.5	56	42.84	Alfalfa Hay	50.4
Oats	70.1	32	22.43	Prairie Hay	46.7
Barley	77.7	48	37.29	Corn Fodder	53.9
Wheat	80.7	60	48.42	Corn Fodder (Drought)	46.1
Barn	72.2	40	28.88	Oat Hay	47.3
Rye	76.1	56	42.61	Barley Hay	51.9
				Corn Silage	17.1
				Corn Silage (Drought Stricken)	15.0

a/ Figures for T.D.N. taken from Frank B. Morrison, *Feeds and Feeding*, the Morrison Publishing Company, Ithaca, Abridged, 1949.

Table 4. Crop Acres, Yields - Fodder and Hay Acres, Yields
of Case Farm, 1928-37

Year	Corn		Wheat		Oats		Barley		Rye		Buckwheat		Corn or Oats Native		Tame Hay			
	Ac.	Y. bu.	Ac.	Y. bu.	Ac.	Y. bu.	Ac.	Y. bu.	Ac.	Y. bu.	Ac.	Y. bu.	Ac.	Y. Ton	Ac.	Y. Ton		
1928	130	14	90	5	45	28	35	14	—	—	15	20	30	1	100	.1	25	1
1929	90	16	70	10	60	25	40	15	—	—	30	15	30	.6	100	.2	25	.2
1930	120	13	—	—	60	25	90	22	—	—	30	27	35	.6	110	.1	15	.1
1931	65	2	—	—	30	0	80	15	—	—	60	0	85	.3	110	.1	40	.5
1932	130	20	—	—	40	31	85	22	—	—	30	30	30	1	110	a/	25	1
1933	70	0	—	—	40	0	100	0	—	—	20	—	75	.3	110	.1	15	.6
1934	120	0	125	0	55	0	50	0	50	0	13	0	b/	.1	64	c/	15	a/
1935	80	10	180	2	65	9	190	3	—	—	20	11	70	1	105	1	15	.1
1936	140	0	130	0	60	0	70	0	60	0	14	0	—	—	120	a/	15	a/
1937	130	4	100	0	50	0	60	0	30	1	15	0	b/	1	135	.4	—	—

a/ Not available.

b/ Part of corn cut for fodder.

c/ Hayland pastured during summer months.

Table 5. Forage Acreage and Yield of Case Farm, 1937-51

Year	Corn or Cane Fodder Acreage	Fodder Yield Tons Per Acre	Native Hay Acreage	Native Hay Yield Tons Per Acre	Time Hay Acreage	Time Hay Yield Tons Per Acre
1937	a/	1.1	135	.4	—	—
1938	85	.6	b/	—	—	—
1939	151	.3	70	.1	—	—
1940	145	1.1	105	.1	15	d/
1941	160	.6	120	.1	—	—
1942	190	2.0	160	.7	44	d/
1943	20 c/	8.	100	d/	74	d/
1944	49	.6	95	.9	—	—
1945	10 d/	3.5	100	.8	25	d/
1946	25	1.1	120	.8	93	1.2
1947	—	—	120	.7	63	1.0
1948	—	—	160	.6	100	1.8
1949	—	—	130	.5	180	.7
1950	—	—	130	.3	200	.7
1951	40	10.1	130	d/	202	.5

- a/ Cut part of corn for fodder.
- b/ Pastured during summer months.
- c/ Silage.
- d/ Not available.

Table 6. Work Units, Man Work Days, Number of Workers, and Work Units per Worker of Case Farms, 1928-51

Year	Work Units on Machinery		Man Work Days		Work Units on Crops a/		Total Work Units	No. of Workers	Work Units Per Worker
	Work Units on Machinery	Work Units on Crops b/	Man Work Days	Work Units on Crops b/					
1928	350		266		383		563	2.1	281
1929	346		236		405		624	2.2	312
1930	404		252		551		784	2.2	390
1931	349		236		568		899	2.5	359
1932	293		256		581		1083	3	361
1933	284		230		554		1183	4	296
1934	184		299		592		1138	3	379
1935	155		352		449		1028	3	342
1936	190		342		618		1261	3	420
1937	188		331		610		1322	3.2	410
1938	171				609		1255	4	313
1939	208				657		1405	3.7	379
1940	223				771		1511	3.4	440
1941	324				821		1498	3.1	483
1942	496								
1943	622								
1944	529								
1945	548								
1946	632								
1947	712								
1948	640								
1949	748								
1950	741								
1951	677								

a/ No work unit standard available for horse power machinery, one man work day equal to one 10 hour day work per worker.

b/ Work unit standard available for power machinery on crops 1938-51.

Table 7. Net Cash Income and Operator's Labor Earning of Case Farm
North Central Area, a/ 1928-51

Year	North Central Area Net Cash Income b/	Net Cash Income Farm	Operator's Labor Earnings Farm	Operator's Labor Earnings North Central Area c/
1928		3255	- 247	
1929		3758	3150	
1930		2298	-6725	
1931		1460	-3577	
1932		364	-1554	
1933		484	- 554	
1934		914	- 828	
1935		785	- 263	
1936		405	468	
1937		519	- 502	
1938		844	83	
1939		1118	27	
1940		474	358	
1941		2706	5513	
1942		3763	6810	
1943	4546	7044	7988	2616
1944	5440	11252	11399	4464
1945	7716	9731	7175	5809
1946	9780	9524	19696	7895
1947	12996	23726	17079	8721
1948	11694	21945	2872	6626
1949	8374	21333	9561	- 85
1950	8029	23025	14953	4687
1951	8409	15368	1408	3502

a/ Source: South Dakota Farm Record Project Summaries - 1943-51.

b/ Not available for North Central Area 1928-42.

c/ Not available for North Central Area 1928-42.

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