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Planning Minimum Sized Farms for the Beadle County Area in Central South Dakota

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Bulletin 341 January, 1940

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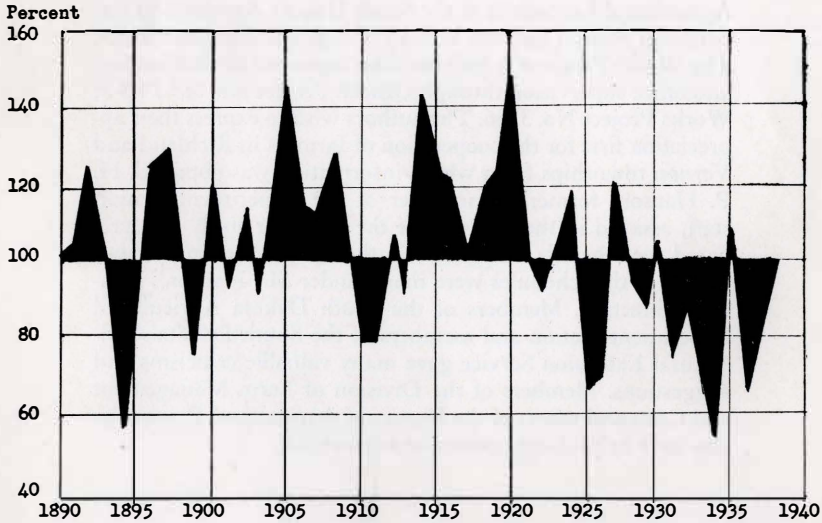

Source: Weather Bureau (USDA) BAE, S.D. Agr. Exp. Sta., S.D. WPA Chart

Variation in precipitation by crop years at Huron, S. D., 1890-1938, expressed in percent of 1906-1938 average, 18.68 inches = 100. For 15 years prior to 1920 precipitation was, in general, much above average; the next 18 years it was below, especially after 1930.

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and
Bureau of Agricultural Economics, Division of Farm Management and Costs
United States Department of Agriculture, Cooperating

Acknowledgements

This study was made cooperatively by the Department of Agricultural Economics of the South Dakota Agricultural Experiment Station and the Bureau of Agricultural Economics. The Works Progress Administration furnished clerical helpers and office supervision through Official Project No. 665-74-3-2; Works Project No. 3286. The authors wish to express their appreciation first for the cooperation of farmers in Richland and Vernon townships from whom information was obtained. H. P. Hanson, formerly a member of the Experiment Station staff, assisted in the selection of the areas for study and prepared the schedule blank used in the field. Preliminary tabulations of the schedules were made under Mr. Hanson's technical direction. Members of the South Dakota Agricultural Experiment Station and members of the South Dakota Agricultural Extension Service gave many valuable criticisms and suggestions. Members of the Division of Farm Management and Costs and others of the Bureau of Agricultural Economics also gave helpful suggestions and criticisms.

Summary

1. Frequent and wide variation in precipitation is the major factor affecting the prosperity of agriculture in the Beadle county area of central South Dakota. Precipitation at Huron has varied from 10.13 to 27.76 inches and averaged approximately 19 inches for the last 50 years. Average precipitation for the period 1911-1920 was 21.70 inches, compared with 14.97 inches for the period 1931-1938.

Extremely low precipitation seldom occurs two years in succession, but when it does crop failures are usually experienced. Precipitation of less than 17 inches for two successive years has occurred six times; for three years, two times; and for four years, one time. Precipitation of 20 inches or more was obtained during 40 percent of the years, and, in these years, available records indicate the production of unusually good crops.

2. Two disastrous droughts have been experienced in Beadle county since its settlement. Both occurred during periods of low prices, and were preceded by high precipitation and good crops. The first occurred in the 90's, and the second and most severe one in the 30's. The combined drought and depression in the 30's caused acute agricultural distress, and it became necessary for the Federal government to furnish assistance. The severity of the distress was intensified because land values and debts established during the World War had not been fully adjusted. Prices of farm products were high and crop yields unusually good during the boom days of the World War which climaxed a relatively prosperous 20 years of rising prices and good crops.

3. The extreme variation in crop yields from year to year and for longer periods probably is the most serious obstacle to the development of a stable, self-supporting farm economy in the area. The average total grain production in Beadle county for the period 1924-1930 was three and one-half times the average production for the period 1931-1938.

4. Drought periods emphasize the need for a type of agriculture that will make the most of the productive resources of the area and still be adaptable to variations in production. Such an economy must be capable of contraction during adverse periods and yet be capable of expansion rapid enough to take advantage of periods of more favorable production. A major problem in this connection is to avoid land speculation and overcapitalization in good years and keep capital investment in line with long-time production capabilities of the land.

5. A farm organization combining livestock and cash grain production appears to be best adapted to the area. Such a system should include livestock enterprises that could be expanded or contracted to conform with the feed supplies available. Cattle and hogs appear to meet these requirements. Individual operators may find it to their advantage to have a combined cattle and sheep enterprise or to substitute turkeys for chickens or some of the hogs.

6. Livestock enterprises would, however, tend to increase the drought hazard unless they managed to meet the wide variations in crop production. Farm operators should follow a policy of starting each winter with a two-year supply of feed for all livestock except hogs and turkeys. Reserve feed for hogs and turkeys need not be carried if breeding stock is kept according to the number of hogs or turkeys that can be raised with the grain on hand at breeding time.

7. A farm of 480 acres (rented basis) appears to be the *minimum* size that will provide a very conservative standard of living for an average family in this area. Since this is the *minimum* and not the *optimum* size of farm, the amount of capital that might be accumulated on such a farm would be very small. A larger farm would be needed by any average family that expects either to have more than a very moderate standard of living or to retire debts very rapidly. An operator buying a farm and attempting to make payments on it would also need more than 480 acres. Operators in the area represented by Richland township can expect to make slightly better returns than those in the Vernon area.

8. The need for direct Governmental assistance in the area is likely to continue unless operators are able to build up their farms and prepare for future adverse periods by accumulating feed and financial reserves.

Drought and depression in the 30's caused severe financial distress in the area. In 1937, a high percentage of tenancy existed, livestock numbers and feed supplies were depleted, equipment was worn out, and a large percentage of the operators were nearly bankrupt.

9. A good operator on an average 480-acre farm (rented) having an equity of approximately $1,000 in his livestock and equipment, can build up his farm organization to that suggested in this report (assuming average or medium conditions). This would require about 7 years. During this rebuilding process, he would have an average of $400 annually for cash family living expense and would increase his equity in the business by about $325. As shown by the proposed plan, the farm would also provide the operator a house, two hogs, a yearling steer, 70 chickens, 200 dozen eggs, and the equivalent of 300 pounds of butterfat for family use each year.

10. Rebuilding of farm units and rehabilitation of operators can be accomplished only if rather liberal credit is available. Principal payments probably should be deferred several years. Agencies extending credit to carry out such a program would necessarily be sympathetic to the policy of accumulating feed reserves, and considerable flexibility in repayment plans would be necessary.

11. Credit inadequate to finance the rebuilding of farm units would make it necessary to start with large units, do more cash-crop farming, obtain more favorable rental rates, or obtain F.S.A. grants. The actual solution would probably be a combination of these.

12. Long-term leases and cooperation of landlords would be necessary for a program of rehabilitating tenant farmers by rebuilding farm organizations and accumulating reserves.

13. Operators whose finances permit should be encouraged to acquire farms when such farms can be purchased at prices in keeping with expected long-time yields. Increased stability of tenure by farm ownership greatly increases the feasibility of feed reserves and encourages the keeping of livestock. The purchase contract should contain a flexible payment clause, and the operator should adopt a policy of making payments two or three years in advance.

14. The most practicable method of building feed reserves would be to keep surpluses in good years. It would seem that there might be a place for an "ever-normal haystack" program similar to the ever-normal granary now being used for corn. Loans of some kind probably would be necessary to finance feed reserves. Consideration might be given to applying crop insurance payable in kind to feed crops in this area.

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Planning Minimum Sized Farms for the Beadle County Area in Central South Dakota

James L. Paschal* Aaron G. Nelson† and Olav Rogeness‡

Introduction

The Problem. A group of 24 counties, comprising an area frequently known as the Central South Dakota Problem Area, has many problems that are common to the Northern Great Plains (Fig. 1). This Dakota area includes the counties of Lyman, Tripp and Gregory, west of the Missouri River, and all of the counties between the Missouri River and a line extending from north to south along the eastern boundaries of Brown, Sanborn and Charles Mix counties. This transitional area, which is between the more stable farming areas in the eastern part of the state and the ranching areas west of the Missouri River, is one of high agricultural risk.

Relatively high precipitation during the World War period produced bumper crops which sold at inflated prices causing excessively high land values. Credit was extended on the basis of these values. Low prices received for agricultural products in the early 20's did not provide farmers with sufficient income to meet interest and principal payments on these debts. Many farmers lost their entire holdings during this period, and others were forced to refinance. Conditions improved during the late 20's, but acute agricultural distress was caused by the drastic decline of the prices of farm products and the series of drought years which followed 1930. Many farmers became bankrupt and were forced to leave the area, while many of those who remained did so only with public assistance. The federal government has been forced to spend considerable sums of money in the form of benefit payments, loans and outright relief.

The Purpose of This Study. This report analyzes some of the more important problems and presents ways and means of increasing the stability of the agricultural economy of the area by:

1. Analyzing some of the climatic and economic factors affecting agriculture in central South Dakota to determine a type and **minimum** size of farm that could support an average family over a period of years.

2. Suggesting policies that might assist farm operators, landlords, and public agencies in developing and maintaining the type of agriculture and size of farm found to be most desirable.

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The Procedure. Vernon and Richland townships were selected for intensive study. Each farmer in the sample areas was visited and pertinent information was obtained concerning his past experience and present situation and needs. Supplementary information was obtained from weather records, census reports, soils surveys, publications of the United States Department of Agriculture, Agricultural Experiment Station and Extension Service bulletins.

General Description of Area

Topography and Soils[1]**.** The average elevation of Beadle county is between 1300 and 1400 feet. The northeastern quarter of the county is practically flat, and the remainder is undulating. The county lies in the drainage basin of the James River. Most of the drainage runs into numerous small depressions from which the water is removed by percolation and evaporation. These depressions are usually filled with water in the early spring, but many of them dry early enough so that they can be cultivated, and others are dry in time for the cutting of hay. During wet years a large percentage of these depressions contain water throughout the year. Drought conditions since 1930 have dried nearly all of even the deeper depressions.

In general, water supply for both livestock and domestic use is adequate; however, a shortage sometimes is experienced in dry years by farmers depending on shallow surface wells for their water supply. In 1937, 20 percent of the operators in Vernon and 6 percent of the operators in Richland township reported an inadequate supply. Artesian water of good quality is found throughout the county at a depth of 750 to 1,050 feet.

Soils in the county are of glacial origin, derived chiefly from granite, limestone and shale rock. The glacial drift varies in thickness from a few feet to over 100 feet. The soils of the Barnes series dominate the area. This series covers about 65 percent of the county. Approximately 41 percent of the county is Barnes loam, 14 percent Barnes silt loam, 8 percent Barnes very fine sandy loam and 2 percent Barnes fine sandy loam. The Beadle series, covering 8.5 percent of the county, has the same general characteristics as the Barnes series, except for the presence of a compact subsurface layer that makes soils of this series of less agricultural value. Beadle soils are better adapted to grass than to small grains.

"The Barnes Series includes those types having a dark brown surface soil passing into a friable brown subsoil, and this in turn into a yellow friable substratum of till, containing finely divided lime and lime concretions."[2]

"The Barnes loam is considered one of the best soils in the county. Its open structure and lime content make it favorable for bacterial action, and the legumes do well upon it. It is probably the best corn soil in the county, and good yields of small grains are obtained."[3]

1. Information largely from "Soil Survey of Beadle County," 1924, by W. I. Watkins, C. E. Deardorff, J. G. Hutton and J. A. Machlis.

2. *Ibid.* p. 1484.

3. *Ibid.* p. 1487.

The topographic and soil condition in the Beadle county area are in general well represented by Vernon and Richland townships. (See Fig. 1.)

The soils of the Barnes series predominate in both areas. The area represented by Vernon township forms the western edge of the Barnes soils. They are lighter, more sandy, and somewhat more subject to wind erosion than the slightly heavier soils found in the area represented by Richland township. There are, however, a few places in each area that are subject to rather serious wind erosion. The area represented by Richland township is usually considered slightly more productive than the Vernon township area.

Precipitation. From the agricultural point of view, variation in the amount of precipitation is the outstanding feature of the climate of Beadle county (Fig. 2). The annual precipitation at Huron for the period 1889 to 1938 varied from 27.76 inches in 1920 to 10.13 inches in 1934.[4] The average precipitation for the period 1906 to 1938 was 18.68 inches. (See appendix Table 1.) Because of the relatively limited annual precipitation, the amount which falls during the growing season, April 1 to August 31, is of major importance. (See appendix Table 2 for precipitation by months.) Shortage of moisture during May and June may result in severe crop damage so that abundant rainfall later in the season fails to produce satisfactory yields. The average precipitation in May is 2.60 inches and in June, 3.45 inches. The average precipitation for the growing season is 12.98 inches, but varied from a low of 6.34 inches in 1894 to a high of 23.90 inches in 1905. Although the distribution of precipitation through the year, especially during the growing season, is significant, the total precipitation for the crop year is a major factor in determining high or low crop production.

In addition to the year-to-year variations, there have been considerable variations between longer periods. The average precipitation for the crop year during the period 1931-38 was 14.97 inches, compared with 17.94, 21.70, 20.21 and 19.37 inches respectively for the four preceding decades (Table 1). These five periods were, respectively, 80, 96, 116, 108 and 104 percent of the 1906-38 average. The average precipitation for the 1931-1938 period was approximately one third less than for the 1911-1938 period.

Beadle county has long, cold winters, relatively cool springs, and hot summers. The average annual temperature is 44.6 degrees Fahrenheit. Average temperature for the growing season is 62.9 degrees. The lowest temperature on record, a minus 43 degrees, occurred in January, 1912, and the highest, 111 degrees, occurred on July 20, 1934. The average frost-free period is 146 days, between May 5 and September 28. The shortest frost-free period on record, 83 days, occurred in 1902, and the longest, 196 days, in 1938. Occasional hot winds during the summer damage crops.

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4. Annual precipitation as used in this report refers to the crop year, September 1 of preceding year to August 31 of designated year. Averages used in connection with precipitation and temperature are for the period 1906-38 unless otherwise stated. The 1906-38 average was used as a base period to facilitate an over-all study of Central South Dakota by the S. D. Agricultural Experiment Station. Records at many of the more important stations do not go back beyond 1906. The 1906-38 averages at the Huron station are approximately the same as the 1889-1938 averages.

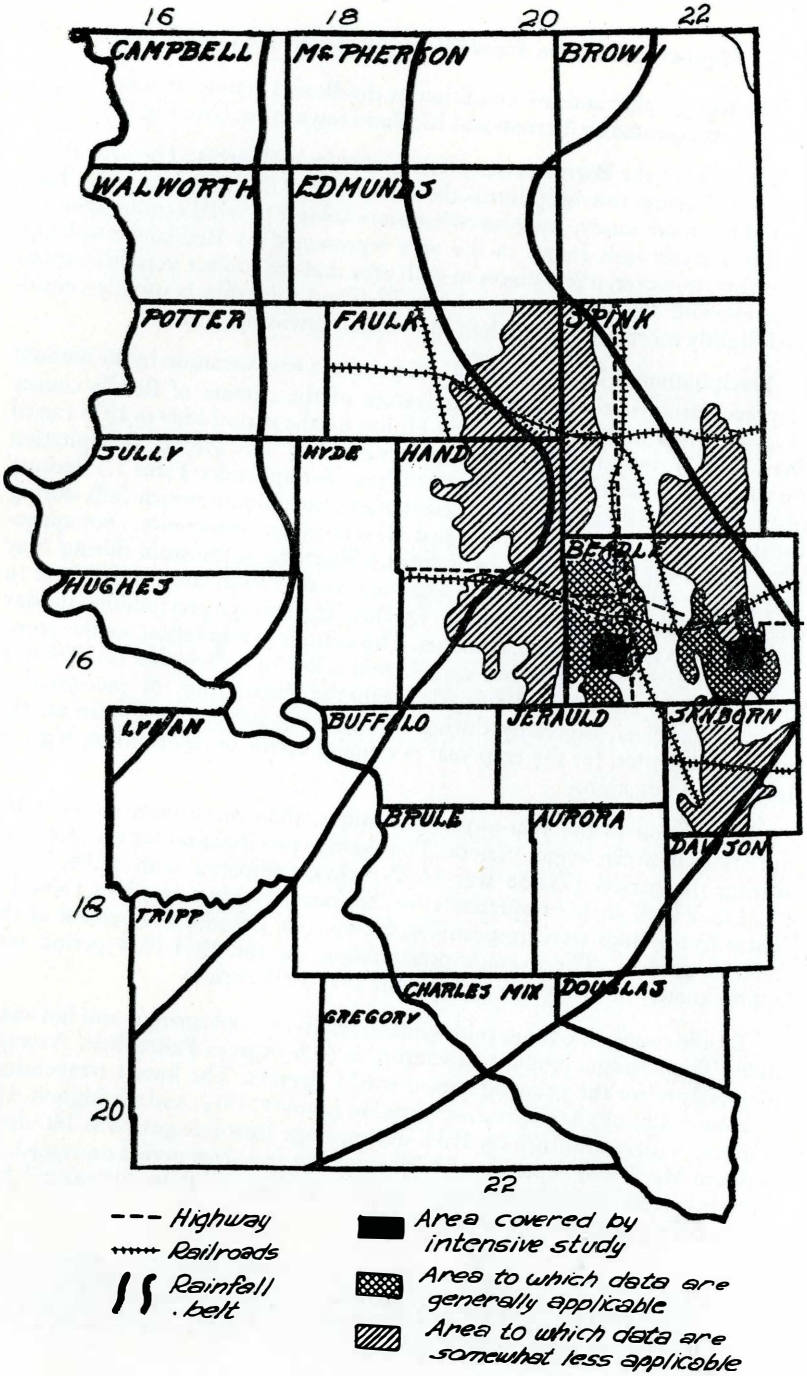

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Fig. 1. Areas Studied. The general statements made in this bulletin are believed to apply

Table 1. Precipitation and Temperature at Huron, South Dakota by Periods, 1891-1938

Period (Crop Years)	Precipitation (April 1-August 31) Inches	Precipitation (April 1-August 31) Percent*	Temperature (April 1-August 31) Degrees	Temperature (April 1-August 31) Percent*	Precipitation (Crop Year) Inches	Precipitation (Crop Year) Percent*
1891-1900	13.36	105	62.8	100	19.37	104
1901-1910	13.50	106	61.2	97	20.21	108
1911-1920	15.89	125	62.0	99	21.70	116
1921-1930	12.04	95	63.4	101	17.94	96
1931-1938	9.72	76	65.8	105	14.97	80
1889-1938	12.98	102	62.9	100	18.91	101

* 1906-1938 = 100.

Period 1931-38.—These years were the driest of any on record at Huron. The crop-year precipitation was 80 percent and the growing-season precipitation was 76 percent of the average. Accompanying this unprecedented drought was an average temperature of 65.8 degrees, which was 105 percent of the 1906-38 average. Beginning with 1931 and following in chronological order, the precipitation was 13.73, 16.41, 12.56, 10.13, 20.41, 12.13, 15.25 and 19.11 inches. (See appendix Table 1.) Only in 1935 and 1938 was precipitation above average. In five of the eight years precipitation was below 15.26 inches.

The lowest precipitation on record occurred in 1934 and was accompanied by one of the highest growing-season temperatures (averaging 68.2 degrees). Growing-season precipitation was average or above only twice during the 1931 to 1938 period. In four of the eight years, the growing-season precipitation was 65 percent or less of the 1906-38 average. The average was 3 inches below the 1906-38 average.

Period 1921-30.—During this decade, the average crop-year precipitation was 17.94 inches and the average growing-season precipitation was 12.04 inches, or 96 and 95 percent of the average. The only years during which a serious shortage of precipitation occurred were 1925 and 1926 when the precipitation was 12.36 and 13.00 inches, respectively. Since the two dry years were preceded and followed by unusually wet years, and since growing-season temperatures were approximately average, it appears reasonable to conclude that climatic conditions were favorable to good crop production during this decade.

Period 1911-20.—During the decade that included the World War, precipitation averaged 21.70 inches for the crop year and 15.89 inches for the growing season, or 116 and 125 percent of the average. Production statistics

to shaded areas. Each of the areas is reasonably uniform in physical features (topography and soils), and economic factors (ownership of farm land, tax delinquency and subsistence grants). These factors, together with a general knowledge of the respective areas, formed the basis for the assumption that conditions found in the sample townships also apply to the larger areas. It must be recognized, however, that these assumptions are true only in a broad sense and that differences in local situations will modify the conclusions. For example, the annual precipitation diminishes as one proceeds in a westerly direction. Soil productivity, size of operating units, tax delinquency, mortgage indebtedness, and tenancy also vary from township to township. All these factors should be given full consideration before the results obtained in a sample township are applied to a given area.

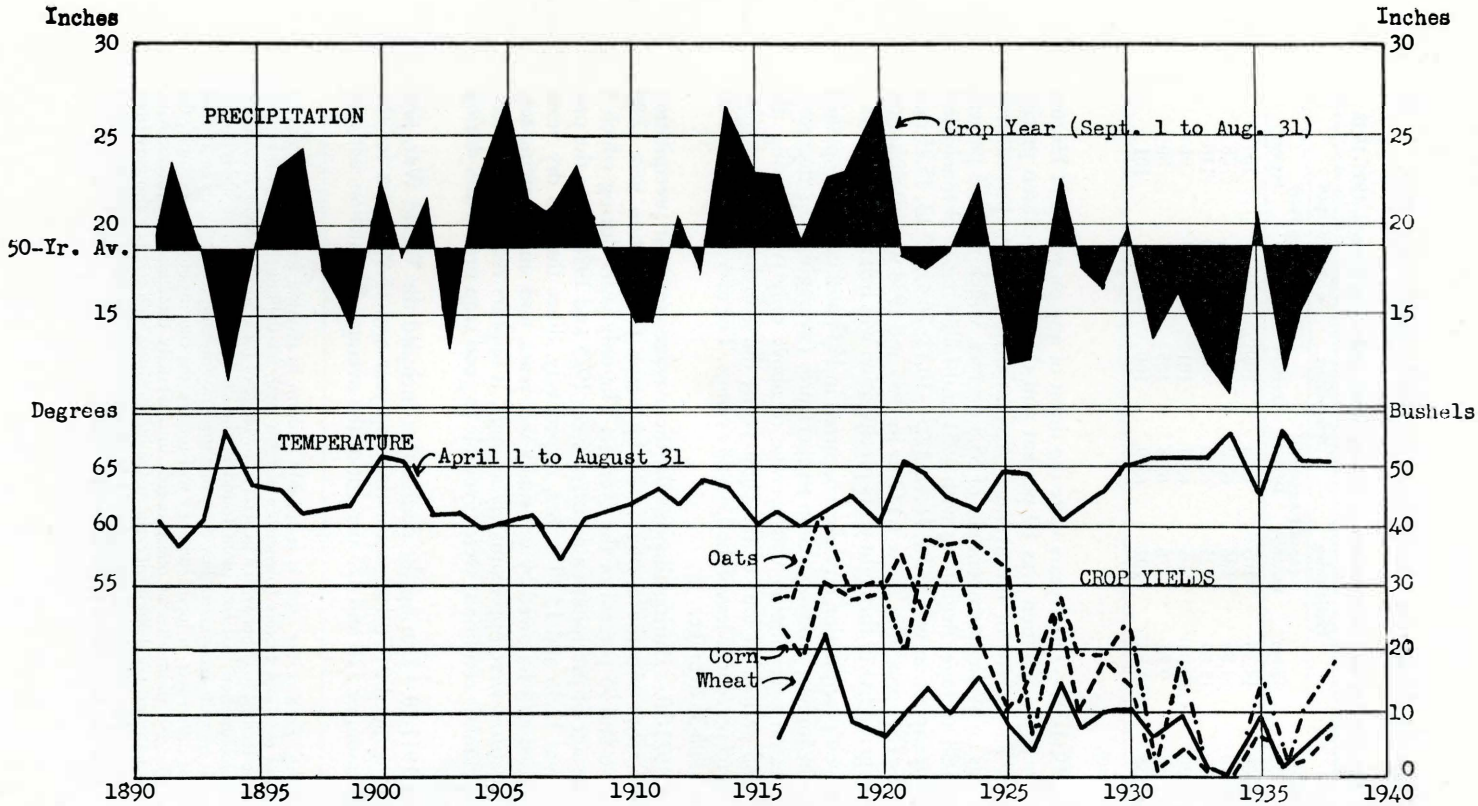

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Fig. 2. Precipitation and Temperature, 1891-1938, Huron, South Dakota, and Crop Yields, 1916-1938, Beadle County, South Dakota. Precipitation at Huron varies widely by years and by longer periods. Periods of severe moisture deficiencies occurred around 1894, 1910, 1925, and in the 30's. The unusually high precipitation during the period 1914 to 1920 was followed by a downward trend which resulted in the most serious drought in history during the early 30's. Crop production declined greatly during this drought period. The yields of wheat, however, declined relatively less than other crops. The droughts of the early 90's and of the 30's were accompanied by unusually high temperatures.

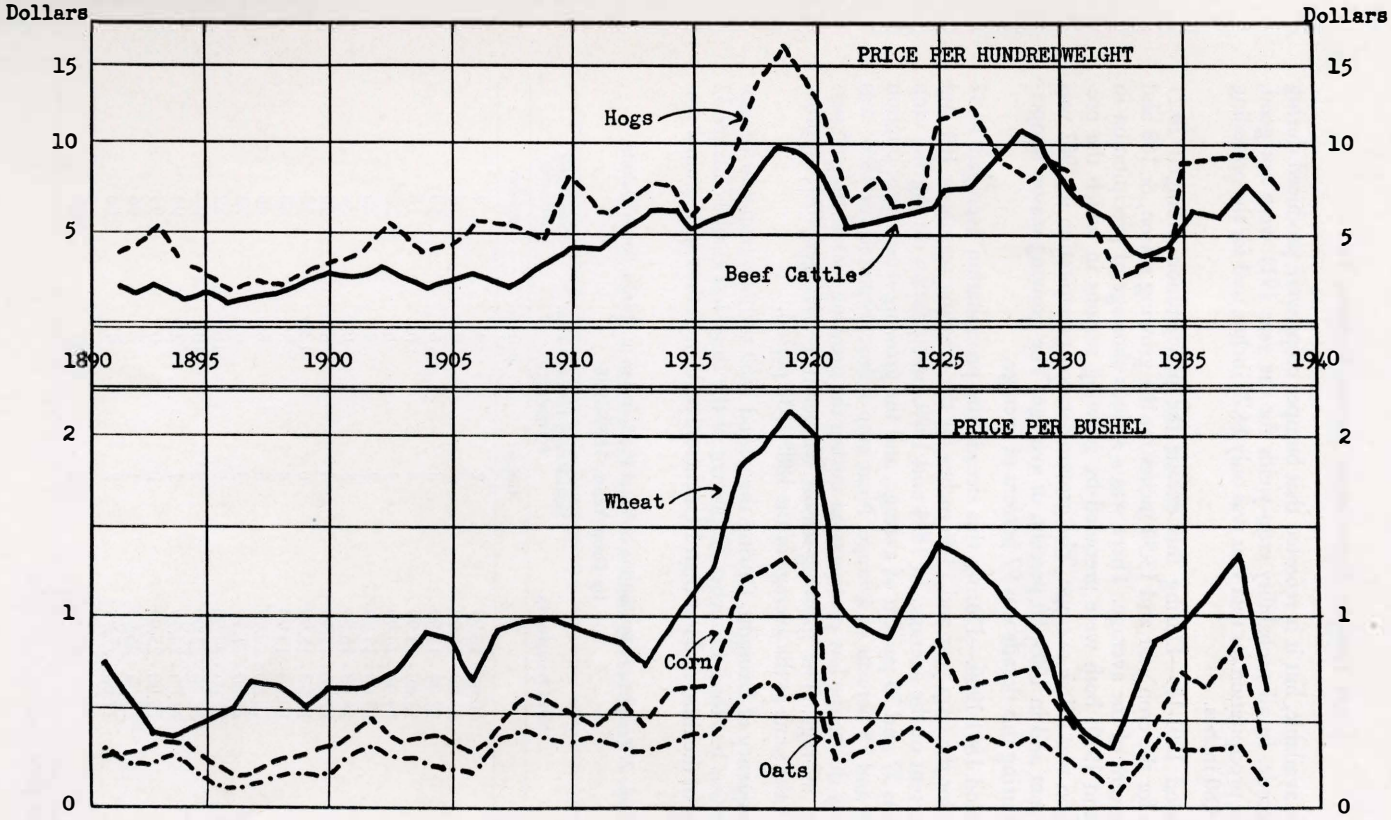

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Fig. 3. South Dakota Farm Price of Selected Crops and Livestock, 1891 to 1938. The drought of the 90's (Fig. 4) occurred during a period of extremely low prices. For approximately 20 years following the drought of the 90's farm prices rose and in general the precipitation was favorable. The unusually high prices received from 1914 to 1920 were accompanied by high rainfall and good crop yields. The low prices of the early 30's were accompanied by the most serious drought on record. This combination of adverse circumstances caused severe financial distress in the Beadle County area.

are not available, but it is reported that bumper crops were produced during this decade. In all probability crop yields for the year 1911 were not good, because precipitation for that year was only 14.78 inches, and for the preceding year 14.80 inches.

Period 1901-10.—During this decade the precipitation averaged 20.21 inches for the crop year and 13.50 inches for the growing season, or 108 and 106 percent of the average. There was a serious shortage of precipitation in 1903 and 1910; both were preceded by growing seasons in which the precipitation was below average. The growing-season precipitation in 1902 was 85 percent and in 1909, 80 percent, of average. The growing-season temperature during this decade was 97 percent of average.

Period 1891-1900.—During this decade the precipitation averaged 19.37 inches for the crop year and 13.36 inches for the growing season, or 104 and 105 percent of the average. In 1894 and 1899, precipitation during the crop year was 57 and 76 percent of average, and the growing-season precipitation was 50 and 78 percent of average. Near crop failure, reported for 1895, was probably due to the low precipitation during the growing season, only 85 percent of average. The growing-season temperature averaged 62.8, approximately the same as the average of the 1889-1938 period.

Frequency of Drought. During the period 1889 to 1938, crop-year precipitation was less than 15 inches 22 percent of the time, less than 17 inches 32 percent of the time, and less than 18 inches 40 percent of the time. Annual pre-

Table 2. Frequency Distribution of Total Precipitation at Huron, South Dakota, by Crop Years, 1889-1938

Total Precipitation	Years Having Indicated Total Precipitation		Cumulative Percentage
	Number	Percent	Percent
10.00 - 10.99	2	4	4
11.00 - 11.99	0	0	4
12.00 - 12.99	3	6	10
13.00 - 13.99	3	6	16
14.00 - 14.99	3	6	22
15.00 - 15.99	2	4	26
16.00 - 16.99	3	6	32
17.00 - 17.99	4	8	40
18.00 - 18.99*	6	12	52
19.00 - 19.99	4	8	60
20.00 - 20.99	3	6	66
21.00 - 21.99	3	6	72
22.00 - 22.99	5	10	82
23.00 - 23.99	5	10	92
24.00 - 24.99	1	2	94
25.00 - 25.99	0	0	94
26.00 - 26.99	1	2	96
27.00 - 27.99	2	4	100
Total	50	100	100

* The 50-year average falls in this group.

cipitation of 20 inches or more was obtained 40 percent of the time (Table 2). Seven of the 16 years in which precipitation was less than 17 inches were recorded during the period 1931-38. (See appendix Table 1.)

Annual precipitation of less than 15 inches for two successive years has been recorded only three times. Two successive years of less than 16 inches of precipitation have occurred four times. Precipitation of less than 17 inches during each of two successive years has occurred six times, during each of three successive years twice, and during each of four successive years but once. Both the 3- and 4-year periods occurred during the period 1931-38.

Precipitation of less than 18 inches has occurred two years in succession eight times; three years, two times; and four years, one time. The 50-year record shows eight instances when precipitation of less than 18 inches was not followed by more than 18 inches. The record also shows only two times when two successive years with precipitation less than 18 inches were not followed by a third year having 19 inches or more. The first time occurred in 1933 and the second in 1934. The period 1931-34 is the only one on record in which precipitation for four successive years was less than 18 inches.

Table 3. Grain Crop Yields per Harvested Acre Beadle County, South Dakota, 1916-1938*

Year	Corn	Winter Wheat	Durum Wheat	Spring Wheat	Oats	Barley	Rye	Flax
	bu.	bu.	bu.	bu.	bu.	bu.	bu.	bu.
1916	23.0			5.6	27.1	27.2		4.3
1917	17.0			14.3	30.0	27.3	18.5	6.0
1918	32.0			22.0	44.0	36.0	20.0	13.0
1919	27.0			8.0	29.0	24.0	12.0	9.0
1920	28.0			6.0	31.5	18.0	9.5	9.5
Av. 1916-20	**25.4**			**11.2**	**32.3**	**26.5**	**15.0†**	**8.4**
1921	35.0			9.0	20.0	18.5	18.0	7.5
1922	25.0			13.0	38.0	22.0	22.0	9.5
1923	37.0			9.5	37.0	25.0	13.0	9.0
1924	22.1	17.0		15.7	37.5	26.3	12.8	9.4
1925	10.0	9.2	10.3	7.5	32.1	19.5	10.5	5.0
1926	14.6	6.8	4.5	4.1	7.1	7.7	4.2	5.6
1927	27.0	11.7	16.8	14.5	28.2	23.4	15.4	9.4
1928	10.5	6.0	9.5	7.0	19.0	13.2	7.6	4.3
1929	18.3	9.0	10.8	10.3	19.4	12.6	10.1	5.4
1930	13.5	14.2	12.1	11.9	24.4	21.5	15.0	3.6
Av. 1921-30	**21.3**	**10.6†**	**10.7†**	**10.3**	**26.3**	**19.0**	**12.9**	**6.9**
1931	0.6	6.1	4.7	5.6	2.9	6.7	5.6	1.0
1932	4.8	13.4	9.7	9.1	18.5	15.0	12.7	3.0
1933	0.9	2.6	0.0	1.3	0.0	0.0	1.8	0.0
1934	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1935	6.8	10.4	9.0	9.3	16.9	13.8	14.0	2.3
1936	2.2	4.0	2.5	1.2	2.0	1.0	2.8	0.0
1937	2.9	8.0	5.3	4.1	11.0	9.0	13.0	2.0
1938	7.0	10.0	10.0	8.0	18.0	17.0	10.0	5.0
Av. 1931-38	**3.2**	**6.8**	**5.2**	**4.8**	**8.7**	**7.8**	**7.5**	**1.7**
Av. 1916-38	**15.9**	**8.6†**	**7.5†**	**8.6**	**21.5**	**16.7**	**11.6†**	**5.4**

* Farm Productions and Prices, 1890-1926, Agr. Exp. Sta. Bul. 225. S. D. Agr. Statistics, 1924-1936. U.S. D.A. (Unpublished). S. D. Agr. Statistics, Annual Reports, 1937-1938, U.S.D.A.

† Average for years reported.

0.0—Yield placed at zero. No data reported. Crops known to be complete failure or nearly so.

Variation in Crop Production. The extreme variation in crop yields from year to year, and even for longer periods, probably is the most serious obstacle to a stable, self-supporting farm economy in the Beadle county area.

In contrast to the complete crop failure in 1934, average Beadle county yields as high as 37 bushels of corn, 22 bushels of wheat, 44 bushels of oats and 36 bushels of barley per acre have been harvested (Table 3).

The 22-year average yield in bushels per harvested acre for the period 1916 to 1938 was: corn, 15.9; spring wheat, 8.6; oats, 21.5; and barley, 16.7. There is little question that yields such as these, if obtained regularly, would maintain a stable, self-supporting farm population.

It is extremely difficult for a farmer to remain solvent during periods such as 1931 to 1938 when the yield of corn per harvested acre averaged 3.2 bushels, spring wheat 4.8, oats 8.7 and barley 7.8. Contrasted with these low yields are those for the decade 1921-30 when the average yield of corn per acre was 21.3 bushels, spring wheat 10.3, oats 26.3 and barley 19.0.

Further evidence of the wide variation in crop production is shown in Fig. 4. The average grain production for Beadle county was 41,000 tons for the period 1931-38, contrasted with 146,000 tons, or more than three times as much, for the period 1924-30.[5] While the total grain production for three of the years from 1931 to 1938 was approximately average, there were three years when practically no grain was produced (See Fig. 4).

Wheat crops were a failure or nearly so more than one-third of the time according to a summary of the yield experience of farmers in Vernon township who had been on the same farm ten years or more (average 20) in 1937. Fifteen percent of the wheat crops yielded less than one bushel per acre, and 21 percent yielded one to five bushels. About half (48 percent) of the crops yielded 6 to 11 bushels per acre, and only 16 percent yielded 12 bushels or over. Wheat yielded more than five bushels per acre for approximately six crops out of ten.

Seventeen percent of the corn crops yielded less than three bushels per acre, and 20 percent yielded three to 14 bushels. Nearly half (47 percent) of the corn crops yielded 15 to 28 bushels per acre and 16 percent, 29 bushels or more, making a total of 63 percent or slightly more than 6 crops in 10 when corn yielded more than 14 bushels per acre in Vernon township. Most of the extremely low yields reported by these farmers occurred after 1930.

A summary of the crop yield experience of farmers who had lived on the same farm 10 years or more in Richland township indicated that variations in wheat yields were approximately the same as those in Vernon township. Corn yields were slightly higher in Richland than in Vernon township. The frequency of corn yields of less than three bushels per acre was the same in both townships; however, 3 to 14 bushels yield were experienced 25 percent of the time in Richland township, compared with 20 percent in Vernon township. Corn yields of 29 bushels or over occurred 26 percent of the time in Richland township and only 16 percent of the time in Vernon township.

5. The total production of all crops including corn was converted to tons.

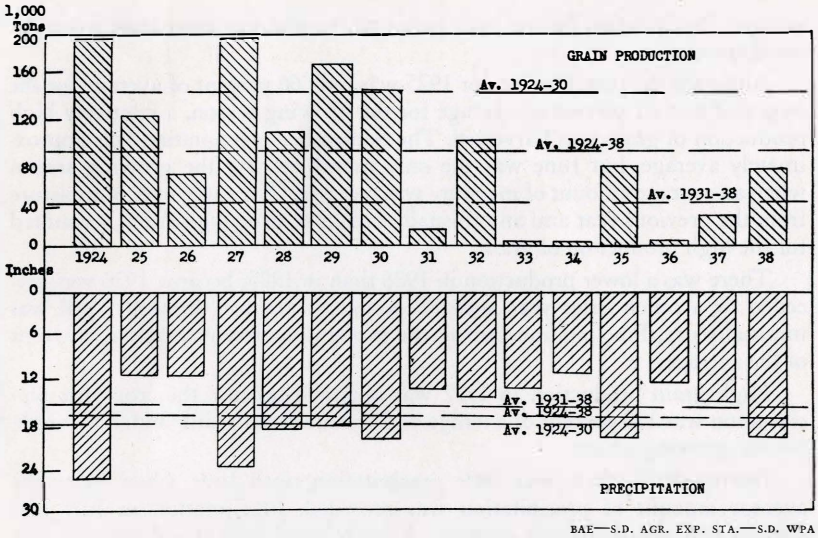

Fig. 4. Precipitation at Huron and Total Production of Grain in Beadle County, 1924-1938. Precipitation is a major factor affecting crop production in Beadle County. Variation in precipitation results in good crops and failures within a year or two of each other. A series of relatively good crops was followed by a series of crops which were poor to failure. Average precipitation or crop production are apt to be misleading.

Precipitation and Crop Production. Precipitation is a major factor affecting crop production in Beadle county, but other factors such as hail, grasshoppers, hot winds, and the distribution of moisture throughout the year are important. Heavy precipitation when the ground is frozen may drain away and not be effective in assisting crop production. Likewise, several inches of torrential rain may run off quickly and be of little benefit to the crops and may even damage them. Light showers during the hot summer months may evaporate almost immediately without any beneficial effects to the crops. Hot winds may nearly burn up a crop and be followed by considerable precipitation that has little effect so far as that particular crop is concerned.

A shortage of precipitation during May and June, which is a critical period for all crops, may seriously affect yields even though there is an abundance of precipitation at a later period. Precipitation during the period April 1 to July 31 is particularly important to the growth of small grains, and, the amount of precipitation in August is important to the growth of corn and sorghums.

In general, there is a close correlation between total precipitation and grain production in Beadle county (as shown in Fig. 4). Chances for a crop appear to be good when 18 inches or more of precipitation fall during the crop year, but lesser amounts usually result in poor crop yields.

High production was obtained in 1924 when the annual precipitation was 119 percent and precipitation during the growing season was 133 percent of

average. Precipitation during both June and August was more than twice the usual amount.

Although the precipitation for 1925 was only 66 percent of average for the crop year and 62 percent of average for the growing season, a relatively high production of grain was harvested. The September precipitation was approximately average, but June was the only month during the growing season when an average amount of moisture was received. The carry-over of moisture from the previous year and an unusually favorable growing season, accounted for the high production of grain.

There was a lower production in 1926 than in 1925, because 1926 was preceded by a much drier year and the period September through April was unusually dry. Precipitation during the growing season was only 77 percent of the average.

High grain production in 1927 was obtained because the crop year precipitation was 123 percent of average and was uniformly distributed throughout the growing season.

During 1928, there was little precipitation until June when twice the average amount of precipitation was recorded. Precipitation in July and August was approximately average. A fairly good crop was harvested that year.

Grain production in 1929 was unusually good considering that precipitation during the crop year was 88 percent and during the growing season was 72 percent of average. Precipitation in March and April of that year was 0.6 and 1.4 inches above average, but during May, June, July and August it was respectively 1.5, 2.3, 1.0 and 0.2 inches below average.

Fairly favorable precipitation during the fall of 1929 probably accounts for the high production of grain in 1930.

Only a very small crop was harvested in 1931 because the precipitation during the growing season was 50 percent of average.

Although a fairly good crop was harvested in 1932, the precipitation during the growing season was only 72 percent of average. The months of June and July were 1.2 and 2.5 inches below average; however, the precipitation during the previous December was 2.2 inches or approximately four times the average, and it is probable that the moisture received in December soaked into the ground and was available for the crops in 1932.

Following the relatively dry year of 1932, precipitation during the growing season of 1933 was 64 percent of average, and very little grain was harvested.

The dry year of 1933 was followed by the driest year on record, 1934, and a complete crop failure was experienced.

Although the precipitation for 1935 was 109 percent of average and the growing season precipitation was 122 percent of average, the total grain production was much less than ordinarily would be expected when this amount of precipitation was received. The low production of grain was in all probability due to the extreme dryness of the two previous years. There was relatively little subsoil moisture in the fall of 1934.

Precipitation in 1936 was only 65 percent of average, and the grain crop was nearly a complete failure. This lack of moisture was a major cause of the very poor crop in 1937 when precipitation was 82 percent of average. A much larger crop would likely have been obtained had 1936 been a wet year.

Although precipitation for the 1938 crop year was 102 percent of average and precipitation for the growing season 110 percent of average, the total production of grain was less than half that obtained in 1929 when precipitation was 88 percent of average. The year 1938 was preceded by two very dry years whereas the year 1929 was preceded by two wet years.

Development of Beadle County

Since the homesteading of Beadle county in the early 80's, the experience of agriculture in this area has been one of instability, marked particularly by two periods of disastrously low prices and poor crop production.

The index number (1910-14 base) of the wholesale prices of farm products in the United States rose from 72 in 1879 to 99 in 1882. This rise was only temporary, and prices continued in the long decline which had begun shortly after the Civil War. The index dropped from 87 for 1883 to a low of 56 for 1896. From this point, the index gradually rose to 118 for 1916 and a high of 221 for 1919. Prices then collapsed, and the index for 1921 was 124. The index rose to 154 for 1925 and declined to 147 for 1929. The index dropped to 72 for 1933.[6]

The Northwestern Railroad reached Huron in June, 1880. A short boom caused by temporary increase in farm prices and abundant rainfall attracted homesteaders, and by 1883 nearly all available government land had beed filed on. Most of the land was taken up in 160-acre tracts; however, around 25 percent of the settlers acquired an additional 160 acres through either the tree claim or preemption acts. Many of the settlers who came to the area to speculate left soon after they had secured title to their land. Part of the land thus vacated was used by remaining operators to expand their units.

It is reported that "The first settlers in Beadle county, from about 1880 to 1890 or a little later, produced wheat almost exclusively. Only an occasional farmer gave his attention to cattle or sheep. The rainfall during the early part of the decade was far above normal, and the yield of crops was phenomenal. Wheat often yielded 40 bushels to the acre. The succeeding drier years brought small yields of wheat and almost a total failure of the crop in 1894 and 1895. Many farmers had bought expensive machinery and had mortaged their farms; a large proportion of these were sold under foreclosure and the farms became the property of nonresidents. Hundreds of farms were abandoned, and the population decreased.

"The small percentage of farmers who had given their attention to stock raising were doing well. More corn began to be grown, and mixed farming with smaller acreage than formerly took the place of big wheat farms."[7]

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6. Warren. George F., and Pearson, Frank A., *Gold and Prices*. John Wiley and Sons, Inc., New York. 1935. pp. 31-32.

7. Atlas of South Dakota, 1904.

The writings of Doane Robinson, a South Dakota historian, dealing with this period state: "In June 1893 the great national panic fell upon the country and was severely felt by the Dakotans, who were just beginning to recover from the troubles incident to the reaction from the boom and the poor crops of 1889 and 1890. Banks everywhere went down and values shriveled up like corn blades in a fierce drought. Many enterprises which were in a way to do much for State development were swallowed up, and in spite of a very good crop the people of South Dakota felt that the hand of every man was against them, and great despondency followed.

"As if 1889 and 1890 had not been sufficient to try the souls of the strongest Dakotans, and sort out and drive away every man who did not possess the courage of a Christian Martyr, 1894 presented to the people of the young state the poorest average crop yet produced. No locality was favored above another and little more than the seed was secured. Every section produced something, and the previous experiences had taught the people not to place their sole dependence upon wheat. The livestock interest had been expanded, dairying was in vogue, and the ever-reliable hen contributed largely to keeping the wolf from the door."[8]

Precipitation was, in general, sufficient to produce satisfactory crops during the 25 years following 1895. Only twice during the period 1896 to 1919 were there two successive years in which the precipitation was low enough to cause crop failure or near crop failure. The period 1897 to 1919 was also one of rising prices. (See Figs. 2 and 3.)

In spite of the disaster which occurred in the late 80's and early 90's, a result of drought and low prices, the people in this area seemed to forget these hard times and believed they had developed a system of farming which was capable of enduring adverse conditions in South Dakota. This attitude was expressed in 1904 by Doane Robinson. "Out of these terrible experiences of the early 90's came the wisdom and the methods which in 10 years has made South Dakota one of the most reliable producers among the States and the first in production in proportion to effort expended.

"The revolution in methods dates from 1894. Then the agriculturist became convinced that the methods, however well adapted to Ohio or New York, were not the best for South Dakota, and he was not long in evolving the lines of operation, the kinds of crops, the method of preparing the soil and planting the seed, which the conditions peculiar to South Dakota demanded. Since 1894 South Dakota farms have produced regularly and abundantly without one approach to failure."[9]

The belief in 1904 that the South Dakota farmer had adjusted has operations to the soil and climatic conditions peculiar to the State was without doubt strengthened by the experience of men who farmed during the 15-year period 1904 to 1919. Very few of the farmers in Beadle county in 1919 had experienced a combination of drought and low prices or even a series of years

8. Robinson, Doane, *History of South Dakota.* B. F. Bowen and Co., 1904. Vol. I, pp. 352-3.
9. Ibid. p. 353.

when prices declined. Unusually high prices and above average rainfall occurred during the years 1916 to 1920 and excellent crop yields were obtained. (See Figs. 2 and 3.)

The phenomenal prosperity of agriculture during the World War period not only erased nearly all memory of the hard times of the 80's and 90's, but also served as a basis for the establishment of extraordinarily high land values. A large amount of land was mortgaged at these values. The drastic decline of prices which occurred in 1920 caused severe hardship in the case of farmers who had mortgaged their farms heavily during the World War. Assistance of credit agencies, such as the Federal Land Bank and Rural Credits Board of South Dakota, helped to cushion the shock caused by the break in prices and land values.

The period of acute distress was relatively short, and the severity was lessened somewhat by fairly good crops during this period. Conditions improved in the later 20's when the index of farm prices varied from 154 in 1925 to 147 in 1929.

Another drastic decline in prices which started in 1929 was accompanied by the most serious and prolonged drought on record at Huron, South Dakota. (See Figs. 2 and 3.) (See also appendix Tables 3 and 4.)

The story of what has happened since 1930 is well known. Farmers lost their holdings, and creditors took heavy losses and became unwilling land owners. Banks failed, taxes became delinquent, and the extension of aid by the Federal government in the form of credit, benefit payments, and outright relief in large sums became necessary.

The distress which has occurred in this area since 1930 has been caused to a large extent by the same combination of poor crops and low prices which caused the hard times during the late 80's and early 90's. At no time in the history of this area has there been a period of several years of extremely low prices accompanied by good crops or a period of poor crops and good prices. The effect of such a situation on the economy of the area is not known.

The statement is often made, "All we need is rain and everything will come out all right." If this statement were amended to read, "What we need most is uniform rainfall," it would be more nearly correct. Many farmers who have spent a lifetime in the area have stated that the biggest problem confronting agriculture in central South Dakota is that of surviving drought years and keeping land values and rentals in line with actual income-producing capacity.

Planning Farms for the Area

Type of Farm Required. The preceding sections of this report have presented some of the climatic and economic factors affecting agriculture in central South Dakota. It has been shown that the primary factors causing the agricultural instability of the area are variations in precipitation and prices. The type of farm in this area should be planned to provide sufficient flex-

ibility for surviving drought and depression periods. Such planning would permit the accumulation of reserves during good years for use in unfavorable periods.

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. An operator who is a good livestock man can increase his income considerably by selling his crops through high producing livestock. Livestock production gives the operator an opportunity to use his time to good advantage in the winter and tends to result in a more uniform income and a more stable farm economy.

A further advantage of adding a livestock enterprise is that a given area would provide farms for more farmers, because of the more intensive nature of the enterprise compared with the strictly cash-grain farms on which large-scale equipment requires larger acreages per farm. From the standpoint of soil conservation, the combination livestock and wheat farm is to be preferred over strictly cash-grain farming, for it is more likely to maintain productivity over a period of years.

Although unfavorable liquidation of livestock should be avoided, the livestock organization should be one which can, if necessary, be reduced in drought years and expanded quickly with the return of favorable conditions. Concentrate-consuming livestock would more nearly fill this requirement, but since there is native grass, and since hay and pasture are necessarily a part of the crop rotation, roughage-consuming animals should be included in the livestock organization.

Roughage-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.

Hogs add to the flexibility of the livestock set-up inasmuch as they can be quickly increased or decreased in keeping with the feed supply. The number of sows bred should be determined by the number of pigs that can be fed out with the grain on hand at breeding time.

While there are advantages in livestock production there are also some disadvantages. One of the most serious is the possibility that an operator may not provide feed reserves for drought years and thus be forced either to liquidate his livestock at a sacrifice or to buy feed at high prices. Further, an operator who cannot properly handle livestock probably will have a lower income than if he followed a strictly cash-crop type of farming.

Relatively large numbers of livestock per farm were kept in this area until drought and economic conditions forced drastic liquidations. At the present time, operators are attempting to rebuild livestock numbers.

Minimum Size Family Farm—480 Acres. A 480-acre farm appears to be the smallest unit which would support an average farm family, assuming "medium" yields and prices and average management. This conclusion was arrived at by careful budgetary analysis of information obtained from farmers in the area and from other sources.[10] Budgets were set up to compare the income expected from 160-, 320-, 480- and 640-acre farms (Table 4). A 480-acre unit would provide the standard of living which could be maintained on approximately $400 for annual cash family living expenses plus food fur-

Table 4. Tenant Budgets for Farms of 160, 320, 480, and 640 Acres in the Beadle County Area (Medium Yields and Prices)

Section A.—Crop Production* and Feed Supply

Item	160-ACRE FARM				320-ACRE FARM			
	Am't.	Production	Tenant Sales	Available for Feed†	Am't.	Production	Tenant Sales	Available for Feed†
	A.	Bu. or T.	Bu.	100 lbs.	A.	Bu. or T.	Bu.	100 lbs.
Wheat	13	117	15	30	31	279	105	30
Corn	26	390		217	62	930		516
Barley	24	360		161	31	465		208
Oats					20	420		125
Sorghum fodder	12	12 T		240	17	17 T		340
Tame hay	10	10 T		200	15	15 T		300
Tame pasture	14				24			
Native hay	10	5 T		100	30	15 T		300
Native pasture	41				75			
Farmsteads, etc.	10				15			

Item	480-ACRE FARM				640-ACRE FARM			
	Am't.	Production	Tenant Sales	Available for Feed†	Am't.	Production	Tenant Sales	Available for Feed†
	A.	Bu. or T.	Bu.	100 lbs.	A.	Bu. or T.	Bu.	100 lbs.
Wheat	57	513	235	30	69	621	295	30
Corn	75	1,125		625	100	1,500		833
Barley	50	750		336	55	825		370
Oats	25	525		156	30	630		187
Sorghum fodder	22	22 T		440	30	30 T		600
Tame hay	20	20 T		400	25	25 T		500
Tame pasture	46				70			
Native hay	55	28 T		560	80	40 T		800
Native pasture	110				151			
Farmsteads, etc.	20				30			

* Crops given here might be replaced by some other crops which would suit the needs of the individual operator better. For example, part of the corn acreage might be devoted to grain sorghum or tame hay and sorghum fodder might be altered.

† It was assumed that the tenant purchased the landlord's share of all grain except wheat and fed 50 bushels of his own wheat.

10. These budgets were based upon information obtained directly from farmers in Vernon and Richland townships, Beadle county, supplemented with information furnished by members of the South Dakota State College staff, as well as a careful perusal of published and unpublished material. (See appendix table 6.) Since tenancy is prevalent in the area, all budgets were prepared on a rental basis.

Operators in the area indicated that the usual lease payment was one third of the grain plus cash rent as shown in appendix table 6. However, drought and adverse economic conditions from 1931-1937 reduced farm income to a point which resulted in the elimination of cash rents from most leases. Crop-share leasing was by far the most common in 1937. By 1939 the proportion of land leased on a crop-share plus cash basis had increased considerably. The fairly favorable crop in 1938 and the increased demand for land were probably the primary factors contributing to higher rental charges.

Table 4.—Continued

Section B.—Livestock Organization and Sales

Livestock or Livestock Products	160-ACRE FARM			320-ACRE FARM		
	No. on Farm *	Sales		No. on Farm *	Sales	
		Quantity	Dollars		Quantity	Dollars
Horses	0			2		
Cows—Milked	7	1	30	10	2	60
—Other	0			0		
Yearlings	1	4	182	2	6	273
Calves	6			9		
Bull	0			1		
Hogs†	2	2,000 lbs.	140	7	8,000 lbs.	560
Chickens‡	150	180	108	150	180	108
Total			460			1,001
Eggs, dozens		760	114		760	114
Butterfat, pounds		925	231		1,450	362
Total			345			476

Livestock or Livestock Products	480-ACRE FARM			640-ACRE FARM		
	No. on Farm *	Sales		No. on Farm *	Sales	
		Quantity	Dollars		Quantity	Dollars
Horses	2			2		
Cows—Milked	10	2	60	10	2	60
—Other	8	1	30	17	2	60
Yearlings	3	12	546	4	19	864
Calves	16			24		
Bull	1			1		
Hogs†	10	11,600 lbs.	812	13	15,200 lbs.	1,064
Chickens‡	150	180	108	150	180	108
Total			1,556			2,156
Eggs, dozens		760	114		760	114
Butterfat, pounds		1,450 lbs.	362		1,450 lbs.	362
Total			476			476

* The number as of November 1. This livestock organization can, of course, be varied to conform to the individual operator's likes and dislikes and farm conditions. For example, sheep might be substituted for part of the cattle, or turkeys (200 constitute an economical unit) for chickens or part of the hogs.

In calculating these budgets the cattle were assumed to be of the dual purpose type. It was assumed that not more than 10 cows would be milked by the average farmer. To conform with usual practice in the area, tractor power was used, but horse power may be more desirable in some cases.

The level of production of livestock and livestock products, as indicated by the quantity sold (which does not include products used in the home), is not necessarily the most profitable. They are *not* used here as representing "ideals" to be attained by farmers, but they are approximately what the average operator might obtain with resources available in the area. With better methods of feeding and management, higher production can be obtained, resulting in a larger labor income. Technical information on any of the enterprises may be obtained free from the county extension agent or by writing South Dakota State College.

† It was assumed that 1,200 pounds of pork would be produced per litter, 400 being retained for family consumption.

‡ Each year 350 chicks were purchased for replacement. It was assumed that these were fed to 26 weeks of age with a survival of 80 percent.

nished by the farm, which was estimated to be: Dairy products the equivalent of 300 pounds of butterfat; 200 dozen eggs; a yearling steer; 2 hogs; and 70 chickens. Only around $336 of the cash income would represent a return for the operator's labor. The remainder would be made up of income representing a return for family labor employed on the farm.

Table 4.—Continued

Section C.—Tenant's Capital Investment

Item	160-Acre Farm	320-Acre Farm	480-Acre Farm	640-Acre Farm
	Dollars	Dollars	Dollars	Dollars
Machinery and equipment	1,160	1,285	1,362	1,552
Feed and seed*	1,034	1,828	2,404	2,991
Livestock	585	1,200	1,790	2,445
Total	2,779	4,313	5,556	6,988

* As of Nov. 1. Includes one year's feed reserve for all livestock except hogs in excess of one litter.

Section D.—Tenant's Expenses

Item	160-Acre Farm	320-Acre Farm	480-Acre Farm	640-Acre Farm
	Dollars	Dollars	Dollars	Dollars
Cash expenses:				
Cash rent	72	124	190	271
Seed—Commercial	11	17	28	39
Feed†	204	366	459	552
Tractor fuel, oil, etc.	63	129	185	238
Twine and threshing	29	65	103	120
Automobile and trucking	60	80	125	160
Equipment repairs	46	51	54	62
Veterinary	5	12	18	24
Baby chicks	35	35	35	35
Taxes	17	25	32	40
Miscellaneous	25	35	50	60
Total	567	939	1,279	1,601
Depreciation	176	191	215	221
Interest on investment	139	216	278	349
Total	315	407	493	570

† Includes commercial feed as follows: Chicken mash, $48, and chick starter, $25.

Section E.—Summary of Tenant's Income and Expense

Item	160-Acre Farm	320-Acre Farm	480-Acre Farm	640-Acre Farm
	Dollars	Dollars	Dollars	Dollars
Income—Tenant Sales				
Crop	11	79	176	221
Livestock	460	1,001	1,556	2,156
Livestock products	345	476	476	476
Gross cash income	816	1,556	2,208	2,853
Cash expenses	567	939	1,279	1,601
Net cash income	249	617	929	1,252
Depreciation	176	191	215	221
Farm income	73	426	714	1,031
Interest on investment	139	216	278	349
Family labor income	–66	210	436	682
Family labor	0	84	100	135
Operator's labor income‡	–66	126	336	547
Food from the farm	220	220	220	220
Family labor earnings	154	430	656	902

‡ Returns to the farm operator for his labor in addition to a house, meat, and dairy products furnished by the farm.

The prospect of living on an annual cash income of around $400 plus food furnished by the farm is not in itself attractive, but the distress of the past eight years, even with government assistance, makes an effort towards more independence seem desirable. It appears that such an income is attainable by adjustments that farmers can make (and some have made) with resources available to them in the area and some assistance in the form of credit.

In periods of poor yields or prices, or both, it may be necessary to use the $215 set aside as depreciation on machinery for the purpose of providing family living. Though this might be temporarily expedient, it is economically unsound, and the fund would have to be replaced within a reasonably short time if the farm were to continue operating with adequate machinery.

Farms smaller than 480 acres probably would not return sufficient income in this area to provide a living for an average farm family. There is a possibiltiy of a childless couple or a bachelor "getting by" on 320 acres. This would be true especially if the operator owned the place free of debt and could use interest from his investment for family living.

A farm of 320 acres would return a labor income of $554 to the operator if "high" prices and "medium" yields were assumed, (other factors remaining constant). If "medium" prices and "high" yields were assumed the operator's labor income would be $468. Either situation would likely be only temporary and, in the usual course of events, would sooner or later be offset by low prices or low crop yields. For this reason, it appears that a 320-acre farm would be considered large enough only for a few special cases.

Desirable Size Family Farm. Families who require more than $400 for cash living expenses or who wish to make payments on a farm will need a unit larger than 480 acres. Just how much larger the farm should be depends to quite an extent on the income required.

As indicated in Table 4, section E, the cash return to the farm family from a 640-acre farm would be $682 above expenses and interest charged for the use of capital. If no family labor were available and it were necessary to hire help, the family would have only $547.

A farm of 640 acres would return nothing for the operator's labor and fail to pay all other charges by $231, if "low" prices and "medium" yields were assumed (other factors remaining constant); and by $207 with "low" yields and "medium" prices. Under such conditions, it would be doubtful if a large enough acreage could be farmed to support a family. Unless costs were drastically reduced, crop production probably would be discontinued, and a grazing economy eventually developed.

The budgets shown in Table 4 were based on "medium" prices and "medium" crop yields. The budgets are believed to approach average situations and do not take into consideration variation in crop yields. The situation which might confront an operator if he experienced several good years or several poor years in succession is not given. However, the assumption is made that during good years money will be saved, new equipment purchased, repairs made, feed reserves accumulated, and the farm business put in shape to

withstand dry years and low prices. History of the area indicates that failure to do these things has been largely responsible for the financial disaster of many operators.

Flexible Livestock Enterprises. In planning the farm organization, shown in Table 4 an attempt was made to provide as much flexibility as possible. Feed grain supplies on hand at breeding time, in addition to adequate reserves, should determine the number of brood sows kept. This would tend to prevent the forced sale of feeder pigs in the event of a crop failure. The hog enterprise could be readily expanded or contracted without serious loss if such a policy were followed.

The cattle enterprise in these budgets permits considerable flexibility. The number of cows milked could be varied according to feed supply or amount of labor available. The yearling steers could be sold as calves or, if conditions were favorable, they could be fattened. In the event of an acute feed shortage, some of the older cows could be sold.

Hold Two-Year Supply of Feed. Although there are many problems to be encountered in the accumulation and maintenance of feed reserves, it is believed that a policy of having a two-year feed supply on hand after harvest time each year would do much to stabilize the farm organization and income.[11] The forced sale of livestock at low prices, or the purchase of feed at high prices to carry them through dry years, can to a large extent be prevented by carrying adequate feed reserves.

An attempt has been made to test the adequacy of a one-year reserve feed supply to carry livestock through a series of drought years. The period 1930-1938 was selected, because it included the most severe drought known in Beadle county. In fact, a system of feed reserves which could carry the farm livestock through a period such as 1930-38 would no doubt stand the test of any drought likely to occur in the Beadle county area. During this nine-year period, approximately one half the crops were failures or nearly so, and most of the remainder were below average. Only in 1930 was crop production equivalent to that obtained with "medium" yields as used in the budgets. Production in 1938 was only about three fourths of a "medium" yield. In 1932 and in 1935, it was about two thirds of a "medium" yield, while in 1937 it was less than one half. During the other four years, the crop production was a complete failure or nearly so.

The crop and livestock organization suggested for the 480-acre farm was used in estimating the adequacy of feed reserves. It was assumed that this farm organization existed on November 1, 1930 (Table 4), and that on that date there was a one-year reserve supply of grain and roughage on hand in addition to that needed for the coming year. Except for a reduction in the number of hogs after 1931, the same organization was assumed to have been maintained throughout the test period. Estimates of crop production, feed requirements, and the surplus or deficit are shown in Table 5.

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11. This would consist of sufficient grain and roughage to feed one litter of hogs and all other livestock on the farm for two years (at usual rates of feeding).

Table 5. Estimated Feed Supplies, Requirements, and Reserves on a 480-Acre Tenant Farm in Beadle County, South Dakota, 1930-1938*

Year	Old Feed Carryover Nov. 1	Production Previous to Nov. 1†	Total Supply Nov. 1	Feed Required Year Following Nov. 1	Reserve Nov. 1	Deficit Nov. 1	Feed for Hogs Year Following Nov.1
	100 lbs.	100 lbs.	100 lbs.	100 lbs.	100 lbs.	100 lbs.	100 lbs.
				GRAIN			
1930	472	1,267	1,739	472	472		795
1931	472	198	670	472	198		
1932	198	698	896	472	424		
1933	424	33	457	472		15	
1934		3		472		469	
1935	0	741	741	472	269		
1936	269	91	360	472		112	
1937		415	415	472		57	
1938		835	835	472	363		
				ROUGHAGE			
1930	1,390	2,370	3,760	1,390	2,370		
1931	2,370	870	3,240	1,390	1,850		
1932	1,850	1,786	3,636	1,390	2,246		
1933	2,246	450	2,696	1,390	1,306		
1934	1,306	270	1,576	1,390	186		
1935	186	1,786	1,972	1,390	582		
1936	582	540	1,122	1,390		268	
1937		1,560	1,560	1,390	170		
1938	170	1,786	1,956	1,390	566		

* Grain yields reported for each year were used. Yields of roughage were based on reported South Dakota yields modified to suit Beadle county conditions.

† It was assumed that the tenant purchased the landlord's share of feed crops each year at harvest time.

The annual feed requirement of roughage is an estimated average. It was not varied to allow for good years when the amount of feed available from grazing was relatively high. Likewise, no variation was allowed for dry years when the pasture was short and there was a relatively small amount of feed to be had from grazing grain stubble and corn stalks. In both 1933 and 1934 it is doubtful if there was sufficient pasture to carry livestock through the summer. Extra feeding probably was required at a time when roughage was extremely scarce. The grazing of crops that had failed may have helped some. An operator who had accumulated a reserve of straw stacks could have used these to good advantage.

The estimates indicate that as far as roughage is concerned the livestock could have been carried through the entire period, except for a slight shortage in 1936. The reserve supply on hand November 1, 1938, would have been sufficient for approximately one half year.

On November 1, 1930, there would have been sufficient grain on hand to permit the keeping of all brood sows to farrow in the spring of 1931. This would have been the only time during 1930-38 when more than one brood sow could have been kept. The serious deficit which occurred in 1933 and 1934 would have forced the sale of all hogs and possibly come other livestock. The livestock retained probably would have received little grain. A deficit of grain would have existed in 1934, 1936 and 1937. This would have occurred in spite of the fact that only one sow and litter were included in the feed require-

ments. The grain shortage in the fall of 1936 and 1937 could have been taken care of by less grain feeding or possibly the purchase of a small amount of grain.

Estimates on the problem of feed reserves to carry livestock through droughts have not considered the financial factors involved. It is certain, however, that the farm organization would undergo a severe strain. In the drought years, the income from crop sales (wheat) would have been reduced to nearly zero. Even if the operator were successful in avoiding reduction of livestock numbers, the income from livestock probably would have decreased because of feed shortage. At the same time, expenses would have been reduced but little and might have increased if much feed were purchased. In any event, expenses would take a large part of and perhaps exceed current income. In such cases, reserves would have to be drawn upon to meet operating expenses, as well as family living. Cash reserves would probably have been used first, then working capital would have been depleted, and finally obligations would have become delinquent. This is what happened during the period 1930-1938, but the actual outcome was much more severe than the assumed case just discussed, because many operators did not have reserves of either cash or feed with which to start the period. Forced sale at low prices and the purchase of feed at high prices increased the severity of the problem. The result was that in 1937 a large percentage of the operators were broke or nearly so, and very few, if any, had reserves. Operators in this area were faced with the problem of rebuilding their farm organization and accumulating reserves in preparation for adverse periods which might occur in the future.

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. There are, however, a number of factors which discourage such policies. The investment in reserves, and the type of storage facilities available may be a discouragement, as well as the inability to carry reserves over any long span of time without deterioration and depletion due to weather, shrinkage, and rodent damage. The human tendency to convert salable reserves into cash and then spend the cash must also be considered. Even with these factors to contend with, it appears that operators who survive drought periods will find it necessary to maintain at least a one-year supply of reserve feed.

Security of Tenure Necessary. The question of reserves creates an especially difficult problem for the tenant farmer. Insecurity of tenure and the prospect of having to move feed supplies from one farm to another is almost enough in itself to prevent the accumulation of reserves. This obstacle could be partially eliminated if long-time leases could be obtained or arrangements made for the landlord or the new tenant to take over feed supplies at a fixed price. Another discouraging factor is that many tenants do not have sufficient capital to permit the accumulation of feed reserves. The ever-normal granary program of the Department of Agriculture should be of considerable assistance in overcoming this difficulty. This program makes is possible to store corn on the farm and use it as security for a loan. The corn may be redeemed at any time by payment of the loan.

Farm Ownership. The stability of tenure made possible by farm ownership tends to encourage the development and maintenance of feed reserves, because the possibility of having to move is reduced. Ownership of the farm should be to the advantage of the operator, especially if he can buy at prices which are in line with the long-time productivity of the land. It also encourages livestock enterprises, because operators know how many acres of pasture and feed crops they can depend on year after year.

Operators who do not have sufficient capital to make a down payment on an entire unit may find it to their advantage to purchase a set of improvements and part of the necessary land. Before purchasing part of a unit, the ability to lease sufficient additional land for a considerable length of time should be ascertained.

Reserves in the form of advance principal and interest payments on real estate mortgages may provide a certain amount of drought insurance to operators who can become owners.[12] The operator who plans buying a farm should make certain that the purchase contract contains a clause permitting him to make advance payments. A policy of making payments on mortgages ahead of schedule during favorable years would permit the suspension of payments during unfavorable years.

It should be fully recognized that a certain amount of capital assets is necessary before flexibility is possible. Flexibility in payment schedules offers valuable assistance to those who are in a position to take advantage of it. It will not, however, offset losses from such factors as insolvency, poor management, and low income.

Land Values. The average value of improvements on farms of 480 acres or larger in Vernon and Richland townships was estimated by farm operators to be approximately $2,500 in 1937. This value is much below the original cost and probably lower than it would be in more prosperous times. It was estimated that taxes on such a set of improvements would be $50, insurance, $25, depreciation and repairs, $50. This annual charge of $125 is probably the least that could be expected to maintain a satisfactory set of improvements. Land owners who attempt to maintain an adequate set of improvements on farms of less than 640 or 480 acres will find charges for improvements relatively high per acre.

The assessed value of land (buildings not included) was $22.05 per acre for Vernon township and $22.94 per acre for Richland township in 1938. Assuming an assessed value of $22 per acre and a levy of 18 mills (Vernon had 18.48 in 1937), the taxes on land would be approximately 40 cents per acre or $190 on 480 acres. The $125 charge against improvements plus $190 land taxes totals $315 which the land owner must consider as expense before calculation of net return on investment. The gross income (rent based on one third of grain crops plus cash rent as shown in appendix Table 6) that a landlord might expect from 480-acre farm operated as suggested in this report

12. Very few tenants were in a financial position to make a down payment on a farm in 1937. Purchasers having limited capital would find it necessary to operate a farm larger than 480 acres in order to meet land payments.

would be approximately $700. The landlord's gross income of $700 minus expenses of $315 would leave a net income of $385. Capitalized at 5 percent, the 480 acres (including buildings) would be valued at $7,700 or approximately $16 per acre.

There is some question as to whether or not a tenant on 480 acres can afford to pay $700 rent. If the rent is reduced to $600, the capitalized value of the land would be approximately $12. It should be remembered that the above valuations are based on given assumptions and that changes in crop yields, prices and other factors would alter the conclusion. The limited information available here does indicate, however, that assessed land values are much higher than the income capabilities of the land justify.

Building for the Future—A Seven-Year Program.[13] The average tenant with an equity of $1,000 in his livestock and equipment could, over a period of seven years, build up the farm organization described for the 480-acre unit in Table 4. During this time, he would have $400 a year for cash family living expenses in addition to a house to live in, two hogs, a yearling steer, 70 chickens, 200 dozen eggs, and an equivalent of 300 pounds of butterfat for family use. He would increase his equity in the business by around $325. At the end of 10 years he would be in a position to increase his equity at the rate of approximately $113 per year. These conclusions were arrived at by budgetary analysis as shown in detail in Table 6.

While the increase in operator's equity would increase only about $325 during the seven-year period, there are other benefits which would be obtained. The operator would be on a self-supporting basis during this time, and the policy of carrying feed reserves would provide him with security which should maintain his equity in the business and keep him off relief in the event of crop failure.

In this analysis, the livestock numbers were increased as fast as practicable from the depleted number which were on hand in 1937, without purchasing breeding stock. The number of hogs and chickens was increased as rapidly as the grain supply would permit. The cropping system was planned year by year to provide feed for the livestock as it increased. The policy was followed of maintaining one-year reserve of feed supply for horses, cattle, chickens, and one litter of hogs. Additional litters of pigs to be produced were determined by the amount of grain on hand November 1 in excess of the reserve feed requirements (Table 7).

During the first years, the acreage of wheat was relatively large, because livestock numbers were low and feed requirements were relatively small. As the need for additional feed grains and roughage increased, less wheat was grown (Table 6).

Considerable credit would be required to enable the tenant to build the proposed organization. As already indicated, he would have only $1,000 equity to begin with, thus requiring around $1,800 credit the first year. As

13. The extra three years were added in Table 6 to assist the reader in visualizing how the farm organization will level off.

Table 6. Development of a 480-Acre Tenant Farm Organization From its Condition in 1937 to the Budgetary Standard

Section A.—Cropping System and Feed Supply

	Acres*	Total Prod.	Tenant Share	Seed	Tenant Sales	Tenant Purchases†	Available for Feed	
		Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	100 lbs.
First Year								
Wheat	150	1,350	900	160	690		50	30
Corn	65	975	650	8		325	967	542
Barley	50	750	500	50		250	700	336
Concentrates	265							908
Sorghum fodder	30	30 T.						600
Native hay	55	28 T.						560
Forage	85							1,160
Native pasture	110							
Second Year								
Wheat	160	1,440	960	125	785		50	30
Corn	65	975	650	9		325	966	541
Barley	50	750	500	50		250	700	336
Concentrates	275							907
Sorghum fodder	20	20 T.						400
Native hay	55	28 T.						560
Forage	75							960
Native pasture	110							
Third Year								
Wheat	125	1,125	750	103	597		50	30
Corn	75	1,125	750	9		375	1,116	625
Barley	50	750	500	50		250	700	336
Oats	20	420	280	38		140	382	122
Concentrates	270							1,113
Sorghum fodder	15	15 T.						300
Tame hay	10	10 T.						200
Native hay	55	28 T.						560
Forage	80							1,060
Native pasture	110							
Fourth Year								
Wheat	103	927	618	81	487		50	30
Corn	75	1,125	750	9		375	1,116	625
Barley	50	750	500	50		250	700	336
Oats	25	525	350	38		175	487	156
Concentrates	253							1,147
Sorghum fodder	20	20 T.						400
Tame hay	15	15 T.						300
Native hay	55	28 T.						560
Forage	90							1,260
Tame pasture	7							
Native pasture	110							

* Farmstead, roads, etc., was assumed to occupy 20 acres.

† Tenant purchased landlord's share of all grain except wheat.

Table 6, Section A. (Continued)

	Acres*	Total Prod.	Tenant Share	Seed	Tenant Sales	Tenant Purchases†	Available for Feed	
		Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	100 lbs.
Fifth Year								
Wheat	81	729	486	74	362		50	30
Corn	75	1,125	750	9		375	1,116	625
Barley	50	750	500	50		250	700	336
Oats	25	525	350	38		175	487	156
Concentrates	231							1,147
Sorghum fodder	25	25 T.						500
Tame hay	20	20 T.						400
Native hay	55	28 T.						560
Forage	100							1,460
Tame pasture	19							
Native pasture	110							
Sixth Year								
Wheat	74	666	444	65	329		50	30
Corn	75	1,125	750	9		375	1,116	625
Barley	50	750	500	50		250	700	336
Oats	25	525	350	38		175	487	156
Concentrates	224							1,141
Sorghum fodder	20	20 T.						400
Tame hay	20	20 T.						400
Native hay	55	28 T.						560
Forage	95							1,360
Tame pasture	31							
Native pasture	110							
Seventh Year								
Wheat	65	585	390	57	283		50	30
Corn	75	1,125	750	9		375	1,116	625
Barley	50	750	500	50		250	700	336
Oats	25	525	350	38		175	487	156
Concentrates	215							1,147
Sorghum fodder	21	21 T.						420
Tame hay	20	20 T.						400
Native hay	55	28 T.						560
Forage	96							1,380
Tame pasture	39							
Native pasture	110							
Eighth, Ninth and Tenth Years								
Wheat	57	513	342	57	235		50	30
Corn	75	1,125	750	9		375	1,116	625
Barley	50	750	500	50		250	700	336
Oats	25	525	350	38		175	487	156
Concentrates	207							1,147
Sorghum fodder	22	22 T.						440
Tame hay	20	20 T.						400
Native hay	55	28 T.						560
Forage	97							1,400
Tame pasture	46							
Native pasture	110							

Table 6. (Continued)

Section B.—Livestock on Farm, Beginning of Year, Nov. 1.

Livestock	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year	9th Year	10th Year
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Horses	2	2	2	2	2	2	2	2	2	2
Cows—Milked	5	6	7	8	9	10	10	10	10	10
—Others	1	1	1	2	3	4	7	8	8	8
Yearlings	2	2	3	3	4	5	3	3	3	3
Calves	5	6	6	7	9	11	13	16	16	16
Bull	0	0	0	1	1	1	1	1	1	1
Sows	3	3	8	10	10	10	10	10	10	10
Chickens	65	150	150	150	150	150	150	150	150	150

Section C.—Annual Sales of Livestock and Products

Year	Cows		Yearlings		Hogs	Poultry		Eggs	B. F.	Total
	No.	Dol.	No.	Dol.	Dol.	No.	Dol.	Dol.	Dol.	Dol.
1	1	30	2	91	224	112	67	32	144	588
2	1	30	2	91	154	180	108	114	188	685
3	1	30	2	91	616	180	108	114	231	1,190
4	1	30	2	91	812	180	108	114	275	1,430
5	2	60	3	136	812	180	108	114	319	1,549
6	2	60	7	318	812	180	108	114	362	1,774
7	2	60	9	410	812	180	108	114	362	1,866
8	3	90	12	546	812	180	108	114	362	2,032
9	3	90	12	546	812	180	108	114	362	2,032
10	3	90	12	546	812	180	108	114	362	2,032

shown in Table 6, section D, the cash operating expenses exceed gross cash receipts during the first years, and, if the suggested program were to be followed, it would be necessary for sufficient credit to be extended to cover the deficit. The feed and livestock inventories would be increasing somewhat faster than the indebtedness, and thus security would be provided for additional loans. The inventories would not increase sufficiently fast, however, to make possible the usual margin of security required by private credit agencies.

The large cash deficit which would be incurred during the first five years would not be recommended if any other solution appeared possible. The borrowing of money with which to pay interest is not desirable, and the increased borrowing of money tends to build up a very heavy interest charge.

Under actual operating conditions, it appears that this problem might be solved if the tenant operated a larger farm, the landlord reduced the rent, or the Farm Security Administration made some substantial grants. Equipment replacement might have to take place more slowly. The amount of money allowed for family living ($400) is probably about the minimum for an average family in this area, and little reduction may be expected here. In order to accomplish the job, probably all of these methods would have to be used. The full cooperation of all parties concerned would be required in an effort to develop the desired farm organization.

The difficulties encountered in rebuilding the farm organization of a tenant having a $1,000 equity in his livestock and equipment are apparent. The problem becomes acute when the equity amounts to only $200 or $300, as

Table 6 (Continued) **Section D.—Tenant's Financial Summary**

	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year	9th Year	10th Year
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
1. Current operating expenses*	1,125	1,144	1,372†	1,249	1,265	1,268	1,271	1,279	1,279	1,279
2. Depreciation of equipment‡	215	215	215	215	215	215	215	215	215	215
3. Int. on borrowed capital @ 5%§	90	126	157	182	194	207	210	211	206	201
4. Business outlay	1,430	1,485	1,744	1,646	1,674	1,690	1,696	1,705	1,700	1,695
5. Family's allowance for current expenses	400	400	400	400	400	400	400	400	400	400
6. Operator's total outlay, cash basis	1,830	1,885	2,144	2,046	2,074	2,090	2,096	2,105	2,100	2,095
7. Cash sales—wheat	518	589	448	365	272	247	212	176	176	176
8. —livestock	412	383	845	1,041	1,116	1,298	1,390	1,556	1,556	1,556
9. —livestock products	176	302	345	389	433	476	476	476	476	476
10. Cash receipts, from sales	1,106	1,274	1,638	1,795	1,821	2,021	2,078	2,208	2,208	2,208
11. Increase in debt (6 - 10)	724	611	506	251	253	69	18	–103	–108	–113
12. Debt, beginning of year	1,796	2,520	3,131	3,637	3,888	4,141	4,210	4,228	4,125	4,017
13. Debt, end of year (11 + 12)	2,520	3,131	3,637	3,888	4,141	4,210	4,228	4,125	4,017	3,904
14. Assets, beginning of year	2,796	3,503	4,099	4,662	4,975	5,287	5,422	5,551	5,554	5,556
15. Livestock inventory increase	107	165	290	175	175	85	105	0	0	0
16. Feed inventory increase	593	456	278	154	142	57	30	3	2	0
17. Seed inventory change	7	–25	–5	–16	–5	–7	–6	0	0	0
18. Assets, end of year	3,503	4,099	4,662	4,975	5,287	5,422	5,551	5,554	5,556	5,556
19. Tenant's net worth, end of yr.	983	968	1,025	1,087	1,146	1,212	1,323	1,429	1,539	1,652
20. Int. on tenant's Nov. 1 equity @ 5%	50	49	48	51	54	57	61	66	71	77
21. Family labor earnings (10 + 15 + 16 + 17 + food @ $220 – 4 – 20)	553	556	629	631	625	629	670	660¶	659¶	656¶
22. Rent of farm (landlord's gross income)	722	784	784	762	735	726	715	705	705	705

* Equipment repairs, automobile and trucking, baby chicks bought, and miscellaneous expenses were held constant. Cash rent, seed, feed, tractor operation, twine and threshing, veterinary, and taxes were computed according to the organization.

† Includes bull purchased for $150 at end of year; no bull owned prior to this time.

‡ Assumed that this amount will be used each year for replacement of equipment.

§ It was assumed that the tenant had $1,000 capital to start with and was able to borrow the rest.

¶ The slight difference between these figures is due to feed inventory change (resulting from using whole acres), the resulting variations in interest on feed inventory and rounding figures on interest charges.

was the case with many of the tenants operating in Vernon and Richland townships in 1937. It may be that some of these operators can hope to re-establish themselves only if the Farm Security Administration makes substantial grants for that purpose or if a very much better price and production opportunity presents itself.

Approach to External Problems. The budgets just discussed were prepared on the assumption that medium prices and medium yields would be obtained. Since actual operating conditions would include high prices and low prices as well as good crops and poor ones, there are many factors which could not be presented in the foregoing budget analysis. The most practical method of accu-

Table 7. Estimated Supply and Requirements of Home-grown Feed for Livestock on a 480-Acre Tenant Farm during the Development Period*

Year	Old Feed Carryover Nov. 1	Production Previous to Nov. 1	Total Supply Nov. 1	Feed Required Year Following Nov. 1	Reserve Nov. 1	Feed for Hogs Year Following Nov. 1
	100 lbs.	100 lbs.	100 lbs.	100 lbs.	100 lbs.	100 lbs.
			GRAIN			
1		461	461†	311		150
2		908	908	378	380	150
3	380	907	1,287	390	372	525
4	372	1,113	1,485	410	400	675
5	400	1,147	1,547	431	441	675
6	441	1,147	1,588	451	462	675
7	462	1,147	1,609	461	473	675
8	473	1,147	1,620	472	473	675
9	473	1,147	1,620	472	473	675
10	473	1,147	1,620	472	473	675
			ROUGHAGE			
1		575	575†	575		
2		1,160	1,160	650	510	
3	510	960	1,470	740	730	
4	730	1,060	1,790	895	895	
5	895	1,260	2,155	1,055	1,100	
6	1,100	1,460	2,560	1,215	1,345	
7	1,345	1,360	2,705	1,305	1,400	
8	1,400	1,380	2,780	1,390	1,390	
9	1,390	1,400	2,790	1,390	1,400	
10	1,400	1,400	2,800	1,390	1,410	

* "Production Previous to Nov. 1" refers to feed which had been produced during the summer immediately prior to Nov. 1, which is considered as beginning inventory.
"Old Feed Carryover, Nov. 1" refers to feed which had been on hand one year or more on Nov. 1.

† It was assumed that sufficient feed would be on hand Nov. 1 (beginning of first year) to feed the stock on the farm at that time for the first year.

mulating feed reserves would be for the operator to retain his surplus feed grown in good years. Since prices are usually quite low when crops are unusually good and there is a surplus of feed, it would be to the advantage of both the operator and his creditor to build up feed reserves at such a time. The advantage to be gained by storing feed at a low price so as to avoid purchasing it at high prices during drought years cannot be over-estimated. It would seem that there would be an excellent opportunity to assist the rebuilding of farm organizations by the initiation of an "ever-normal haystack" program which

would enable the operator to borrow money on his feed reserves. Consideration might also be given to applying crop insurance to feed crops. If credit were not available from other sources, it might be to the advantage of landlords (when they are financially able) to extend credit to tenants using feed reserves as security. This would enable the tenant better to withstand adverse periods and would induce good tenants to remain on the same farm.

The Agricultural Conservation Program payments were not considered in the preparation of budgets used in this report because of the possibilities of changes which might occur in the program. It is recognized, however, that if an operator has the opportunity to participate in an AAA program such as the present one, he might reduce the acreage of wheat suggested for the first few years on the rebuilding budget and offset the smaller wheat sales with AAA payments. The suggested type of farming (tenth year) has been shifted in the direction of greater emphasis on hay and pasture, and thus a more conserving farming system. This shift would no doubt be accelerated by participation in the AAA program.

Table 8. Residence of Farmers Operating Land in Vernon and Richland Townships, Beadle County, South Dakota, 1937

Residence of Operator	Vernon		Richland	
	Number	Percent	Number	Percent
On farm in township	43	70	53	89
On farm outside township	14	23	5	8
Not on farm	4	7	2	3
Total	61	100	60	100

The Situation in Vernon and Richland Townships, 1937

Farm Operators. In 1937, the land in Vernon township was operated by 61 individuals. Of these, 23 percent were outside operators; 7 percent were "sidewalk operators"; and 70 percent were bona fide farmers who lived on farmsteads within the township (Table 8). There were 17 vacant sets of buildings, most of which were in very poor condition. The presence of these vacant buildings indicates that operators have enlarged their units by leasing an additional farm.

Outside operators lived on farms in other townships, but operated tracts or farms in Vernon township. Such operations represented, in many cases,

Table 9. Tenure Status of Resident Operators, Vernon and Richland Townships, Beadle County, South Dakota, 1937

Type of Tenure	Vernon		Richland	
	Number	Percent	Number	Percent
Crop-share renter	28	65	20	38
Crop-share cash renter	4	9	6	11
Livestock-share renter	1	3		
Total renters	33	77	26	49
Full owners	3	7	15	28
Part owners	7	16	12	23
Total	43	100	53	100

efforts of farmers to expand their business. Rubber-tired tractors, having relatively high road speed, facilitated this type of operation where fields were several miles apart. A few resident farmers in Vernon township also operated tracts of land several miles from their headquarters.

"Sidewalk operators" lived outside the township and in most cases hired other farmers to work their land. One of these operators owned his own equipment, although his farming was a side line to another business. Another operator lived on his farm, kept no livestock, and contracted his farm work.

In 1937, the land in Richland township was operated by 60 individuals. Eight percent were outside operators; 3 percent were "sidewalk operators;" and 89 percent were bona fide farmers (Table 7). There were 14 sets of vacant buildings in Richland township.

Because of the smaller proportion of "sidewalk operators," and especially outside operators, the stability of farm units in Richland township appeared to be much greater than in Vernon township.

Tenure. In Vernon township, 77 percent of the resident operators were tenants, 16 percent were part owners, and 7 percent were full owners. Sixty-five percent of the operators rented on a straight crop-share basis, 9 percent paid some cash in addition to a share in the crop and 3 percent shared both livestock and crops sold (Table 9).

Tenancy was much less common in Richland township than in Vernon township in 1937. Forty-nine percent were tenants, 28 percent were full owners and 23 percent were part owners (Table 9).

Very few leases were written in either township in 1937, and seldom was the rental agreement for more than one year. In few cases were there any arrangements either for adjusting damages caused to the farm by the tenant or for reimbursing him for unexhausted improvements.

Change in Tenure Status. The tenure and occupational history of farm operators in Vernon township in 1937 indicated that many had experienced an adverse change in tenure status since 1916. The percentage of crop-share tenants nearly doubled between 1916 and 1937. During the same time, the percentage of full owners decreased more than half. Information obtained in the field and analysis of individual history records revealed that the number

Table 10. Period of Residence on Present (Same) Farm, Vernon and Richland Townships, Beadle County, South Dakota, 1937

Years on Present Farm	Vernon		Richland	
	Number	Percent	Number	Percent
1	9	25	5	10
2	5	14		
3	3	9	1	2
4	3	9	2	4
5	1	3	4	8
1 - 5	21	60	12	24
6 - 15	5	14	16	32
16 - 25	5	14	8	16
26 - over	4	12	14	28
Total	35	100	50	100

of crop-share renters increased in almost direct proportion to the number of farm owners who lost their farms and were forced into the crop-share tenant class.

The tenure and occupational history of individual operators in Richland township in 1937 indicates that a certain amount of success had been achieved in climbing the agricultural ladder. A large proportion of the men who were farm or non-farm laborers during the period 1916 to 1920 or earlier are now in the tenant or owner class. The percentage both of crop-share and of crop-share-cash tenants has doubled since 1916. There was, however, a slight decrease in the proportion of owners. Fourteen vacant farmsteads in Richland township in 1937 indicate that some units have been taken over on a lease or purchase arrangement by other operators.

Mobility of Operators. High mobility accompanied the large percentage of tenancy in Vernon township. Sixty percent of the 35 operators reporting in 1937 had remained on their present farms five years or less; 25 percent had been on their farms only one year; and 14 percent, two years (Table 10).[14]

All but two of the 21 operators living on their present farms five years or less and all the operators who had lived on their present farms 6 to 15 years were tenants. Seven of the nine operators who had been on their present farms 16 years or more were part owners, and the other two were tenants.

Although nearly half of the operators in Richland township were tenants, the stability of tenure was much greater than in Vernon township. Twenty-four percent of the 50 operators reporting had been on the present farms five years or less; 10 percent had been on their present farms one year; 14 percent had been on their present farms three to five years (Table 10).

Two of the 12 operators living on their present farms five years or less were part owners, one was a full owner, and the other nine were tenants, Three of the five operators living on the same farm for one year were farmers with one year's experience as operators.

Four of the 16 operators who had been on their present farms 6 to 15 years were part owners, one was a full owner, and the other 11 were tenants. Only three of these operators had ever operated another farm and none had farmed outside of Beadle county.

Of the eight operators who had been on their present farms 16 to 25 years, five were part owners and three were tenants. Only one of the eight had ever farmed outside of Beadle county.

Fourteen, or 28 percent, of the operators had lived on their present farms for 26 years or more. Two of these operators had lived on other farms in Beadle county and three had operated farms outside of the county. Eight of the 14 operators were owners, four were part owners, and only two were tenants.

A relatively high proportion of ownership among operators who lived on the same farm 26 years or more indicates that a number of them have made a living in the area and have accumulated some capital. Net worth data available for part of the operators show that most of them who had lived on their present farms 26 years or more had a substantial equity. There were some indications that net worth tended to increase with years spent on the same farm.

14. "Present" throughout the report refers to 1937.

In Richland township, an average of 364 acres per farm was operated by farmers living on their present farms five years or less, compared with 486 acres by farmers living on the same farm six years or more.

In most cases, in both Vernon and Richland townships, the part owners probably remained on the same farm because of their equity in it. Many other factors on which data were not available may have been responsible for the equity that made for the stability of tenure.

Mobility of Operators and Size of Farms. None of the 14 operators in Vernon township who had been on their present farms six years or more operated less than 320 acres, and only three operated less than 400 acres. All but two of these 14 operators were tenants. The average number of acres operated by farmers on the same farm six years or more was 522, while the average number of acres operated by those who had been on their present farms less than six years was only 336.

Table 11. Average Number of Years Operators, Living in Vernon and Richland Townships, Beadle County, South Dakota in 1937, Spent as Operators There and Elsewhere by Size of Present Farm

Size of Present Farm	Operators	On Present Farm	Elsewhere Beadle County	Outside of Beadle County	On All as Farm Operator
	Number	Years	Years	Years	Years
			VERNON		
160-240	9	2	3	11	16
241-400	13	9	9	1	19
401-560	7	14	4	1	19
561-960	6	16	3	9	28
160-960	35	9	6	5	20
			RICHLAND		
160-240	13	12	6	2	20
241-400	14	21	3	1	25
401-560	11	14	1		15
561-1423	12	21	1	2	24
160-1423	50	17	3	1	21

While the number of cases is small and there are many other factors which had considerable bearing on the success of the individual, the above data indicate that those operators who have experienced some stability of tenure are operating units of at least 480 acres.

The operators of the smallest units seemed to have moved most frequently (Table 11). The nine operators living on farms of 160 to 240 acres in 1937 were tenants and had lived on their present farms an average of two years. All but one of the operators in this group were newcomers to Beadle county within the 5-year period prior to 1938. The one exception was an owner who had been in Vernon township for 18 years prior to 1937. However, the operators had spent an average of three years on other farms in Beadle county and 11 years on farms outside of Beadle county. Part of this mobility may be attributed to the small size farm operated by these individuals, but the history of these operators indicates that the individual might be responsible for the frequent change of

farms. It is generally recognized by the better operators in this area that a farm of 240 acres or less is insufficient to provide a living for an average family and pay rent for the farm. The failure of the farm to net satisfactory returns to the tenant probably caused him to change farms frequently in an attempt to obtain a more satisfactory unit. His inability to pay the agreed rent may have caused the landlord to encourage the tenant to move.

The stability of tenures apparently increased as the number of acres per farm increased. The operators of farms of 240 acres or less had been on the present farms an average of only two years as compared with an average of nine years for the operators in the second size group, 14 years for the third size group and 16 for the group of largest farms. Four of the farms in the third size group were operated by farmers who had been on their present farms two to seven years. The operators of the other three farms had been on their present farms 12, 31, and 34 years, respectively.

Four of the operators on farms in the largest size group had been on the present farms 17 years or more. Even though the relationship between size of farm and stability of tenure is not so clearly shown as might be desired, it is reasonable to assume that within certain limits the larger farm should enable operators to accumulate both financial and feed reserves which should in turn encourage stability of tenure, either as tenant or owner.

Table 12. Financial Statement as of January 1, 1938 of Operators in Vernon and Richland Townships, Beadle County, South Dakota

ITEM	VERNON		RICHLAND		
	Average of 30 Tenants on Farms of 160-1200 A. Average 384	Average of 8 Part Owners on Farms of 320-800 A. Average 557	Average of 22 Tenants on Farms of 160-640 A. Average 352	Average of 11 Part Owners on Farms of 320-1262 A. Average 663	Average of 9 Full Owners on Farms of 160-480 A. Average 264
	Dollars	Dollars	Dollars	Dollars	Dollars
ASSETS:					
Land		3,644*		5,547*	5,800
Buildings		2,069		1,577	2,705
Mach. & Equip.	412	533	640	1,280	558
Livestock	665	877	1,062	2,260	882
Notes Receivable				18	
Total Assets	1,077	7,123	1,702	10,682	9,945
LIABILITIES:					
Real Estate Mortgage		1,675		2,823	1,645
Mortgage on Livestock	284	146	446	242	22
Mortgage on Machinery	25	92	295	58	
Feed and Seed Loans	350	346	470	409	393
Interest, Past Due	23	286	60	85	66
Taxes, Past Due	11	275	12	21	88
Notes Payable	25		83		169
Acounts Payable	26	19	25		
Other Debts	127	183	203	84	80
Total Liabilities	871	3,022	1,621	3,722	2,463
NET WORTH:					
Plus	206	4,101	81	6,960	7,482

* Value of owned land only, averaging 226 acres per farm for Vernon, 281 acres per farm for Richland.

In Richland township, there appeared to be no definite relationship between acres per farm and the number of years the operator had lived on his present farm (Table 11). The operators of smaller units had experienced greater mobility than the others, having farmed an average of six years on other farms in Beadle county and two years on farms outside Beadle county. The greater stability of tenure in Richland township indicates that tenure conditions were more satisfactory than in Vernon township. Approximately half of the operators living on the same farm 16 years or more operated farms in the 320-acre class or smaller.

Financial Status of Operators. In 1937, the average tenant in Vernon township was nearly bankrupt. The assets of 30 tenants averaged only $1,077 while the average liabilities were $871, leaving a net worth of $206 (Table 12). In all probability, the financial condition of many of these operators would be much poorer were it not for the fact that many of them had received considerable assistance in the form of AAA payments and in some cases grants from the F.S.A. Eight of the tenants had a net worth which averaged a minus $716. In many cases, relatively heavy feed and seed loans were included in the liabilities of these farmers. This probably explains why they could remain in business even though their net worth statements were minus quantities. The plus net worth of 22 tenants was uniformly low, averaging $541.

The drought and depression during the preceding eight years reduced the resources of these tenant operators to the point where most of them did not have the funds or credit with which to operate efficiently or to restock their farms. It is obvious that an operator with total assets of little more than $1,000 and a net worth of from $200 to $500 would be unable to weather adverse conditions. A year or two of poor crops would force him to seek public assistance of some kind.

The average net worth of eight part owners was $4,101. Most of these eight part owners had a very substantial net worth. The largest net worth of any operator was $12,886.

The value of machinery and equipment of part owners averaged about $100 higher than that of tenants, and the average investment of livestock was more than $200 higher. There was very little difference between feed and seed loans on the part owner and tenant farms. Delinquent taxes and interest past due were much larger on the farms of part owners.

In 1937 the average net worth of 22 tenants in Richland township was $81 as compared with $206 in Vernon township (Table 12). However, the

Table 13. Age of Farm Operators, Vernon and Richland Townships, Beadle County, South Dakota, 1937

Age of Operator	VERNON		RICHLAND	
	Number	Percent	Number	Percent
22 - 34	8	20	12	24
35 - 44	11	28	11	22
45 - 54	9	22	11	22
55 - 64	6	15	11	22
65 - over	6	15	5	10
Total	40	100	50	100

average assets of Richland tenants were approximately $600 more than those of Vernon tenants. The average net worth of part owners in Richland township was $6,960 and of owners $7,482.

In Richland township, there was no definite relationship between size of farm and net worth of tenant operators. Tenants operating farms of 240 acres or less had an average net worth of a minus $469. The average feed and seed loan of these operators was $525 which probably explains why they could remain in business.

Tenants on farms of from 240 to 400 acres had an average net worth of minus $14. Tenants on farms of 401 acres or more had about the same amount of assets as the 240- to 400-acre size group but had fewer liabilities.

Age of Operator. Twenty percent of the farm operators in Vernon township were between 22 and 34 years of age, and 28 percent were from 35 to 44. Most of the operators under 45 years of age had obtained their farming experience since the boom period of the World War. Half the operators were 45 years of age or older, most of them having obtained some farming experience during the World War period.

Twenty-four percent of the farm operators in Richland township were between the ages of 22 and 34 years, and 22 percent were in each of the age groups, 35 to 44, 45 to 54, and 55 to 64. The average age of 50 operators was 46 years. The distribution of operators by age was approximately the same as in Vernon township except that there were a few more in the youngest and oldest age groups (Table 13).

Family Situation. In Vernon township, families of three or four persons were the most common, but six units were operated by families of two. There were five families of five persons each, two of six persons and two of seven or more persons.

Twelve families contained no children, 10 contained one each, 9 contained two each and 6 contained three. Only four families contained four or more children. Twelve families each contained one boy 16 years of age or older; three families contained two boys of this age. Only two families contained girls 16 years of age or older.

Only one farm larger than 400 acres was operated by a bachelor, and only three farms of this size were operated by families of two persons.

In Richland township, families of four persons were most common. Nine farms were operated by families of two, and three farms were operated by bachelors. There were seven families of five each, four of six each, and four of seven or more.

Eleven families had no children living at home. The most common number of children living at home was two, and the next most common was three.

Only 15 of the families contained boys of 16 years or over. Ten families contained girls 16 years of age or older.

Land Ownership. On March 1, 1938, individuals owned 68 percent of the land in Vernon township, corporations 20 percent, the state 11 percent and the county 1 percent. Between March 1, 1934 and March 1, 1938, 10 percent of the land changed from individual to corporate ownership and 1 percent changed from individual to state ownership.

Table 14. Use of Land Operated Under Different Types of Tenure, Vernon and Richland Townships, Beadle County, South Dakota, 1937*

Type of Tenure	Cropland		Native Hay		Native Pasture		Farmstead and Roads		Total Operated	
	Acres	Pct.	Acres	Pct.	Acres	Pct.	Acres	Pct.	Acres	Pct.
					VERNON					
Owned land	2,376	54	398	9	1,485	33	188	4	4,447	100
Crop-share rented	7,305	66	1,508	14	1,729	16	506	4	11,048	100
Crop-share cash rented	3,476	67	281	6	1,149†	22	267	5	5,173	100
Cash rented	417	23	560	30	803	44	60	3	1,840	100
Livestock-share rented	347	72	28	6	80	17	25	5	480	100
Total	13,921	60	2,775	12	5,246	23	1,046	5	22,988	100
					RICHLAND					
Owned land	6,085	69	609	7	1,527	18	513	6	8,734	100
Crop-share rented	8,192	80	512	5	996	10	493	5	10,193	100
Crop-share cash rented	3,413	60	519	9	1,411	25	316	6	5,659	100
Cash rented	89	16			469	82	12	2	570	100
Livestock-share rented	150	94					10	6	160	100
Total	17,929	71	1,640	7	4,403	17	1,344	5	25,316	100

* Includes some land outside township boundaries, operated by farmers living inside the townships.
† Includes 60 acres of free range.

On March 1, 1938, individuals owned 76 percent of the land in Richland township, corporations 18 percent, the state 4 percent and the county less than 1 percent. Between March 1, 1934 and March 1, 1938, 11 percent of the land changed from individual to corporate ownership and 4 percent changed from individual to state ownership.

Land Use, 1937. In 1937, 60 percent of the land operated in Vernon township was cropland, 12 percent was used for native hay, 23 percent for native pasture, and 5 percent for farmsteads and roads (Table 14).

Slightly more than one fourth or 28.5 percent of the cropland was idle or fallow in 1937 (Table 15). Much of the so-called "fallow" land was not cultivated enough so that it could be readily distinguished from idle land. Part of the land was left fallow or idle because operators did not have sufficient equipment or operating capital to farm it.

Corn was planted on 22.4 percent, wheat 20.6 percent, other small grain 19.0 percent and tame hay 9.3 percent of the cropland.

The use of grass land for hay or pasture varies from farm to farm and year to year depending upon moisture conditions, numbers of livestock kept, and the amount of winter forage available. Native hay usually is cut from the areas where moisture is more abundant, primarily the Fargo soils series which are located in the low spots.

In 1937, 71 percent of the land operated in Richland township was cropland, 7 percent was used for native hay, 17 percent for native pasture, and 5 percent for farmsteads and roads (Table 14). Compared with Vernon township, 11 percent more was in cropland, 5 percent less in native hay and 6 percent less in native pasture.

The percentage of cropland used by operators in Richland township for corn was 24.1, wheat 19.4, other small grains 30.0, and tame hay 11.2 (Table 15). The percentages were approximately the same as for Vernon township, except that for other small grains which was 30 as compared with 19 for Vernon. This difference was offset by the larger percentage of idle and fallow land in Vernon.

Nineteen percent of the land operated in Vernon township was operated by the persons who owned it. The other 81 percent was rented, in most cases from non-resident landlords. Tracts of grassland usually were rented for cash, to supplement cropland on which farmsteads were located. In 1937, 44 percent of the cash-rented land was used for native pasture, 30 percent for native hay, and 23 percent for cropland.

Thirty-five percent of the land operated in Richland township was operated by persons who owned it, 40 percent was crop-share rented, and 22 percent crop-share cash rented. Again, tracts which were rented entirely for cash in most cases were unattached pieces of pasture land which were leased by resident operators to supplement their cropland. Eighty-two percent of the strictly cash-rented land was native pasture, and 16 percent was cropland.

Table 15. Use of Cropland, Vernon and Richland Townships, Beadle County, South Dakota, 1937

USE	VERNON		RICHLAND	
	Acres	Percent	Acres	Percent
Corn, grain	2,918	21.0	4,170	23.3
Corn, silage	29	.2		
Corn, fodder	165	1.2	144	.8
Total corn	3,112	22.4	4,314	24.1
Spring wheat	2,827	20.3	3,466	19.3
Durum wheat	41	.3		
Winter wheat			15	.1
All wheat	2,868	20.6	3,481	19.4
Oats	1,001	7.2	1,861	10.4
Barley	1,229	8.8	2,255	12.6
Rye	356	2.6	1,042	5.8
Flax	30	.2		
Millet	21	.2	64	.3
Other crops*			165	.9
Other small grains	2,637	19.0	5,387	30.0
Alfalfa	102	.7	373	2.1
Cane fodder	882	6.3	1,046	5.8
Sudan grass	44	.3	294	1.6
Grain hay	242	1.7	288	1.6
Other tame hay	35	.3	12	.1
All tame hay	1,305	9.3	2,013	11.2
Tame pasture	20	.1	123	.7
Other pasture	24	.1	336	1.9
Total land in crops	9,966	71.5	15,654	87.3
Fallow	2,293	16.5	1,706	9.5
Idle	1,662	12.0	569	3.2
Total cropland	13,921	100.0	17,929	100.0

* Mixed grains.

Eighty percent of the crop-share rented land was in cropland and 10 percent in native pasture, as compared with an average of 71 and 17 percent respectively for the entire township area. The relatively large percentage of cropland and the small percentage of native pasture indicate the tendency of landlords to encourage the intensive use of as much of the land as possible in an effort to obtain more rent.

The crop-share cash rented land, of which 60 percent was cropland and 25 percent native pasture, represents situations where there was considerable native pasture on the farm. In such cases the landlord may have attempted to get as much as possible from the land by charging cash rent for the native pasture.

Land used for cropland was 10 to 18 percent higher on the share-rented than on the owner-operated land in Vernon and 11 to 25 percent higher in Richland township. While there is some indication that the greater percentage of land in grass may tend toward greater stability of tenure and farm income, adequate information to prove or disprove such a conclusion was not available at the time this report was prepared. The inability of some tenants to accumulate sufficient capital for livestock farming and the desire of some landlords to have every acre of land used as intensively as possible tends to increase the proportion of cropland. The program of the AAA offsets this tendency to a certain extent.

Future Land Use. Barnes loam is the predominating soil in Vernon township. This is true also in Richland township, but there is a very large area of Barnes silt loam in the southeastern part of the latter township. The soils of the Barnes series in Richland township are uniformly deeper and more nearly stone-free than those in Vernon township. There are fewer "potholes" of Fargo silt loam scattered throughout Richland than in Vernon township. Sioux loam, with a gravel subsoil, forms approximately 1,200 acres of Richland township.

Estimates made by farmers in 1937 indicated that wind erosion had affected 39 percent of the cropland in Vernon township. The damage incurred was severe on 3 percent, moderate on 17 percent and slight on 19 percent of the cropland. Most of the severe wind erosion occurred on the sandy soil in the north central part of the township.

Table 16. Size of Farms Operated by Resident Operators, Vernon and Richland Townships, Beadle County, South Dakota, 1937

Size Group	VERNON TOWNSHIP			RICHLAND TOWNSHIP		
	Group Average	Farms of Resident Operators		Group Average	Farms of Resident Operators	
	Acres	Number	Percent	Acres	Number	Percent
160- 240	178	11	26	191	14	26
241- 400	334	15	35	331	15	28
401- 560	496	9	21	470	12	23
561- 720	630	2	5	635	5	9
721- 880	800	4	9	815	2	4
881-1,040	960	1	2	1,040	1	2
1,041-1,200	1,200	1	2	1,120	2	4
1,201-1,423				1,342	2	4
Total	420	43	100	454	53	100

An area of approximately 1,400 acres in Vernon township, occupying all of Section 3, parts of adjoining Sections 2, 4, 10, and corners of Sections 9 and 11, probably can be used to the best advantage for perennial hay and pasture. This area includes Barnes and Sioux very fine sandy loam, which must be carefully handled to prevent wind erosion, and Sioux and Pierce loams which usually are very droughty. The Fargo silt loam, Lamoure silty clay loam, and the lake bed in this area are, at times, too wet for cultivation. Many small areas of Fargo silt loam, located in depressions or shallow drainageways are frequently covered with water. These, and the small areas of poorly drained Lamoure silty clay loam, should be used exclusively for the production of hay and pasture.

All of the Barnes loam under cultivation in 1937 probably should remain so.

Estimates made by farmers in Richland township indicated that wind erosion affected approximately 40 percent of their cropland. The damage incurred was severe on 3 percent, moderate on 23 percent and slight on 17 percent of the cropland. Most of the land which might be returned to grass

Table 17. Cropping System and Land Use on 12 Farms, Vernon Township, Beadle County, South Dakota 1937, 1930, and Usual*

Land Use	1937	1930	Usual	1937	1930	Usual
	Acres	Acres	Acres	Percent	Percent	Percent
Corn	56	89	120	19	36	39
Wheat	79	71	75	26	29	25
Other grain	65	71	97	22	28	32
Cane	17	3	3	6	1	1
All tame hay	12	7	11	4	3	3
Total land in crops	229	241	306	77	97	100
Fallow	47	7		16	3	
Idle	22			7		
Total cropland	298	248	306	100	100	100
Total cropland	298	248	306	62	65	56
Native hay	60	25	73	13	7	13
Native pasture	105	97	160	21	25	29
Farmsteads and roads	20	14	13	4	3	2
Total operated	482	384	552	100	100	100

* "Usual" figures should be used with caution. However, they do indicate in a rough way the change which has taken place in the area. The field enumerators interpreted *usual* as being the most customery crop acreage or number of livestock. It is believed that some farmers probably gave the acreage or number which they most distinctly remember (due to high income from the crops or livestock) while others probably gave the acreage or number of livestock which they considered would be to their greatest advantage over a period of years, disregarding ups and down.

consists of approximately 1,200 acres of Barnes very fine sandy loam. As long as wind erosion can be controlled by crop cover and careful cultivation, this land probably will not be regrassed. Although it is usually susceptible to wind erosion, there is little evidence that such erosion is severe on this or any other soils in the township.

Farm Organization. Since 1930, drought and unfavorable economic conditions have caused numerous changes in tenure, size of farm, and farm organization in Vernon township. In 1937, more than one fourth of the farms were 160 to 240 acres, 35 percent were 241 to 400 acres, and 21 percent were

401 to 560 acres in size (Table 16). Some of the smaller units were remnants of larger farms that had been broken up by unfavorable economic conditions. The operators of some of the small units planned to expand their farms with the return of good crops. Others, especially some of the older operators, were nearly out of business and their units could hardly be considered going concerns.

In 1937, the most common size of farm was 320 acres. Most operators expressed the intention of enlarging their units at the first opportunity. A visit to the township in 1939 revealed that several operators had increased their acreage. Land thus obtained probably was from tracts formerly used by outside operators or by operators of 160-acre units. Six of the eight 160-acre units reporting in 1937 had been enlarged or taken over by other operators in 1939.

Table 18. Livestock per Farm, Vernon Township, Beadle County, South Dakota, 1937, 1930, and Usual

Kind of Stock	Average of 12 Farms in Vernon		
	1937	1930	Usual
	Number	Number	Number
Cattle	12.8	35.4	46.3
Sheep	1.3	3.3	3.3
Hogs	4.3	45.8	67.8
Poultry	58.5	125.8	118.2
Horses	4.1	9.2	13.0

Although the average size of farms in Vernon township increased approximately 100 acres between 1930 and 1937, the acres of crops grown per farm were actually less. While the acres of wheat grown per farm were approximately the same in 1937 and 1930, the relative importance of wheat in the cropping system increased because of a substantial reduction in corn acreage and increases in idle and fallow land per farm from seven to 69 acres. The increase in acres planted to cane was the result of drought conditions which caused other crops to fail (Table 17).

Taking into consideration the unsettled conditions existing in Vernon township in 1937, the same general system of crop production was being followed by operators on farms in the different size groups.

The drastic reduction of livestock numbers in 1934 and 1936 left nearly all farms, regardless of size, with few livestock.[15] Cattle and sheep per farm in 1937 were roughly one third the number kept in 1930, poultry and horses were less than one half, and hogs were approximately one tenth (Table 18).

The relationship that normally would be expected between size of farm and livestock numbers did not exist in 1937. The operators of the large farms, however, had relatively more young cattle and had progressed further in rebuilding their herds than those on the smaller farms. The reduction of livestock numbers followed depletion of feed inventories.

Farm organization seems to have been much less disrupted in Richland township than in Vernon township. In 1937, approximately one fourth of the

15. Further reductions were made in Beadle county after the 1935 census was taken; however, the reductions were not so drastic for the entire county as for Vernon township.

Table 19. Cropping System and Land Use on 23 Farms, Richland Township, Beadle County, South Dakota, 1937, 1930, and Usual

Land Use	1937	1930	Usual	1937	1930	Usual
	Acres	Acres	Acres	Percent	Percent	Percent
Corn	113	106	99	28	37	39
Wheat	78	51	49	19	18	19
Other grain	128	95	86	31	33	34
Cane	19	5	3	5	2	1
All tame hay	38	27	16	9	10	7
Total land in crops	376	284	253	92	100	100
Fallow	26			7		
Idle	5			1		
Total cropland	407	284	253	100	100	100
Total cropland	407	284	253	75	72	70
Native hay	39	24	41	7	6	12
Native pasture	68	67	51	13	17	14
Farmsteads and roads	28	18	15	5	5	4
Total operated	542	393	360	100	100	100

farms were in each of the size groups 160 to 240, 241 to 400, and 401 to 560 acres (Table 16). The most common size of farm was 320 acres. The group of smallest farms appeared to be a more permanent part of the farm economy in Richland than in Vernon township. Several of the owners and a few of the part owners lived on farms of 240 acres or less. A number of the operators who had been on the same farm 16 years or more were also operating units of 240 acres or less. Although definite information is not available, it is believed that most of these cases represent older operators who had decreased the size of their farms by 1937. Not so many operators in Richland as in Vernon township expressed intentions of enlarging the farm unit.

Between 1930 and 1937, 23 farms in Richland township were increased in size by an average of nearly 150 acres per farm (Table 19). The increase in size of unit represents a definite attempt on the part of these operators to minimize the effect of drought and low prices by enlarging units to make more efficient use of labor and equipment. Data are not available to indicate how much of the additional land came from units that have ceased to exist and how much came from units that are still being operated.

Approximately 100 acres of the increase was land in crops, 30 acres were fallow or idle, and the remainder was in native grasses and farmsteads. The cropping system used in 1930 was being followed in 1937 except that, proportionately, less corn was being grown and more land was idle, fallow, or in cane.

Table 20. Livestock per Farm, Richland Township, Beadle County, South Dakota, 1937, 1930, and Usual

Kind of Stock	Average of 15 Farms in Richland		
	1937	1930	Usual
	Number	Number	Number
Cattle	24.6	36.0	33.4
Sheep	10.6	12.7	14.3
Hogs	9.2	23.6	16.0
Poultry	121.5	151.3	149.0
Horses	4.0	5.8	6.9

The percentage of cropland which was idle or fallow was smaller in Richland than in Vernon township. Most of the so-called "fallow" land in Richland township actually was being fallowed in one way or another, but in many cases in Vernon township it scarcely could be distinguished from idle.

There was no significant difference between the cropping systems being used on farms of different sizes in 1937.

Reduction of livestock numbers between 1930 and 1937 was not so drastic in Richland as in Vernon township. The total reduction for these townships was more severe than Table 20 would indicate, because the average size of farms increased considerably during this period and the number of farms decreased. The number of cattle and horses per farm was reduced about one third, and the number of hogs was reduced by more than one half.

In 1937, there was no definite relationship between size of farm and number of livestock kept. The relatively large number of young cattle inventoried indicated an attempt to rebuild cattle numbers.

Whether the farmers in Richland township carried more livestock through the drought than did those in Vernon township because higher crop yields were obtained, because more credit or reserves were available, or because of a combination of these and other factors, cannot be determined from available data.

Farm Equipment. Farmers who were visited in the field and enumerators who took the schedules often stated that machinery and equipment on farms in Vernon township were badly worn and in many cases obsolete. These statements were borne out by equipment values. The average value of equipment per farm was $491 of which $90 was invested in an automobile. Excluding the automobile, the average investment in machinery per farm ranged from $200 for the 160- to 240-acre farms up to $677 for the 721- to 880-acre group. The low investment on the small farms reflects the use of inadequate, old, and badly-worn equipment. It is also true that many of these units could hardly be considered going concerns.

Many of the operators using tractors in Vernon township indicated that they did not have satisfactory tractor equipment. On many farms, badly-worn implements designed for horse power were being used. It is estimated that the investment in adequate equipment for an average 480-acre farm would be $1,362, based on one half the price of new equipment in 1937.

In general, the farms in Richland township appeared to be better equipped than those in Vernon township, although observations made by enumerators indicated that much badly-worn and obsolete equipment was being used in Richland, also.

The average value of equipment on the smallest farms was approximately the same in both townships. However, in the next size group, farms of 241 to 400 acres, the farm equipment value in Richland averaged about $270 more, primarily because of more tractors. In the group of larger farms the average value of equipment was $465 higher in Richland than in Vernon township. This last figure reflects the use of more power equipment in Richland.

Suggestions and Attitudes of Operators. Farm operators were asked to indicate the minimum size unit which in their opinion would maintain invest-

ment in the farm business and return a satisfactory standard of living for a farm family over a period of years. In Vernon township 69 percent of the operators were of the opinion that 320 acres was the minimum. (See appendix Table 5.) Fourteen percent suggested 160 acres, 6 percent 480 acres and 11 percent 640 acres as the minimum. The average farm organization suggested for the 320-acre size group was: 201 acres of cropland, 119 acres of grass, 13 breeding cows, 7 brood sows, 2 brood mares, 4 other horses, 14 ewes, 121 chickens and 5 turkeys. In suggesting these units, the operators evidently were thinking of relatively favorable conditions under which the yields would be much better than those which have been obtained during the past few years. Using average yields in estimating the grain and forage which a farm of this size would produce, it was found that the amount of livestock recommended could not be carried on this size of unit.

In Richland township, 63 percent of the operators, or about the same proportion as in Vernon, suggested 320 acres as a minimum. The suggested organization and livestock numbers for the 320-acre farm differed but little from that suggested for Vernon township. Twenty-five percent of the operators in Richland township suggested a minimum of 160 acres, leaving only a few favoring the larger farms. (See appendix Table 5.) That the optimum size unit is somewhat larger than 160 acres is indicated by the expansion of units which took place between 1930 and 1937. Although there was general belief among operators in both townships that a year or two of good crop yields would solve many of their difficulties, there were a few who thought such relief would be only temporary. It was pointed out that the optimism arising during a series of good years probably would result in higher land and rental values than the long-time income from the land would justify. It was suggested that too many operators would depend on the continuation of good years and fail to build up feed and financial reserves to carry them through adverse periods. The resulting heavy indebtedness that might occur would again cause a great deal of distress for farm operators. This group was of the opinion that another series of years in which both drought and low prices occurred would cause acute distress, even on the larger and better-managed units that might have some kind of reserve. Unless present unfavorable economic conditions improve, there would still be considerable distress in the area even though good crops were obtained.

The estimates of operators in Vernon township on the value of farms varied widely, indicating that some operators were basing value on 1937 conditions and others were still clinging to values recorded in more prosperous times. The operators of larger farms tended to value farms higher per acre than those on units of 400 acres or less. Operators in Richland township valued farms higher than those in Vernon, especially farms of 400 acres or less. There was more agreement on land values among the operators in Richland township than there was in Vernon township, and the values apparently were based on more years of experience. Many of the operators, as well as informed persons living outside the township, expressed the opinion that for agricultural purposes Richland township is one of the better townships in Beadle county.

Appendix

Table 1. Precipitation at Huron, South Dakota, by Seasons, 1889-1938

Year	April 1 - July 31			April 1 - August 31			Crop Year		Calendar Year	
	Actual	1906-1938 =100	Crop Year =100	Actual	1906-1938 =100	Crop Year =100	Actual	1906-1938 =100	Actual	1906-1938 =100
	Inches	Percent	Percent	Inches	Percent	Percent	Inches	Percent	Inches	Percent
1889	11.00	105	73	11.66	92	78	15.04	81	20.17	108
1890	10.80	103	57	11.53	91	61	18.82	101	14.68	79
Av. 1889-1890	**10.90**	**104**	**64**	**11.60**	**91**	**69**	**16.93**	**91**	**17.43**	**93**
1891	12.98	124	67	14.41	113	74	19.43	104	20.17	108
1892	16.87	161	71	19.00	149	80	23.82	128	25.17	135
1893	11.18	106	59	11.77	93	62	18.87	101	16.94	91
1894	5.73	55	54	6.34	50	60	10.62	57	13.56	73
1895	8.06	76	43	10.88	85	58	18.62	100	17.09	92
1896	15.92	151	68	17.09	134	73	23.27	125	26.10	140
1897	10.62	101	43	13.31	105	54	24.62	132	22.74	122
1898	11.43	109	65	11.89	93	68	17.47	94	15.62	84
1899	7.81	74	55	9.87	78	69	14.25	76	13.66	73
1900	12.37	118	54	19.03	150	84	22.71	122	24.73	132
Av. 1891-1900	**11.30**	**108**	**58**	**13.36**	**105**	**69**	**19.37**	**104**	**19.58**	**105**
1901	9.74	93	56	12.24	96	70	17.53	94	21.98	118
1902	8.43	80	39	10.79	85	51	21.60	116	16.42	88
1903	7.40	70	56	8.49	67	64	13.26	71	13.83	74
1904	12.37	118	57	17.02	134	78	21.78	117	20.36	109
1905	20.18	193	73	23.90	188	87	27.52	147	28.93	155
1906	10.92	104	51	15.65	123	73	21.57	115	25.37	136
1907	10.85	103	52	11.01	87	53	20.84	112	15.05	81
1908	17.98	171	75	19.36	152	81	23.89	128	28.67	154
1909	7.82	74	41	10.19	80	53	19.26	103	19.14	103
1910	4.96	47	34	6.39	50	43	14.80	79	10.19	55
Av. 1901-1910	**11.07**	**105**	**55**	**13.50**	**106**	**67**	**20.21**	**108**	**19.99**	**108**

U. S. Weather Bureau.

Table 1 (Continued)

Year	April 1 - July 31			April 1 - August 31			Crop Year		Calendar Year	
	Actual	1906-1938 =100	Crop Year =100	Actual	1906-1938 =100	Crop Year =100	Actual	1906-1938 =100	Actual	1906-1938 =100
	Inches	Percent	Percent	Inches	Percent	Percent	Inches	Percent	Inches	Percent
1911	8.62	82	58	11.44	90	77	14.78	79	18.02	97
1912	11.64	111	58	14.05	110	70	20.14	108	16.75	90
1913	11.22	107	66	13.57	107	80	16.90	90	17.87	96
1914	21.31	203	79	22.60	178	84	26.86	144	30.14	161
1915	12.49	119	54	14.04	110	61	23.05	123	20.70	111
1916	10.06	96	44	15.76	124	69	22.93	123	22.66	121
1917	11.05	105	58	11.84	93	62	18.97	102	18.01	96
1918	14.56	139	65	17.29	136	78	22.26	119	24.03	129
1919	15.80	150	68	17.11	134	73	23.34	125	22.98	123
1920	19.44	185	70	21.18	167	76	27.76	149	27.95	150
Av. 1911-1920	**13.62**	**130**	**63**	**15.89**	**125**	**73**	**21.70**	**116**	**21.91**	**118**
1921	9.49	90	51	12.71	100	68	18.69	100	20.77	111
1922	7.40	70	43	7.79	61	45	17.37	93	15.25	82
1923	11.39	108	60	14.28	112	75	18.92	101	17.97	96
1924	12.40	118	56	16.90	133	76	22.20	119	22.84	122
1925	7.50	71	61	7.92	62	64	12.36	66	10.13	54
1926	8.25	78	63	9.74	77	75	13.00	70	16.60	89
1927	13.45	128	59	15.82	124	69	22.90	123	21.07	113
1928	11.30	108	64	13.44	106	76	17.62	94	18.07	97
1929	7.16	68	44	9.15	72	56	16.40	88	17.51	94
1930	9.08	86	46	12.66	100	64	19.84	106	21.47	115
Av. 1921-1930	**9.74**	**93**	**54**	**12.04**	**95**	**67**	**17.94**	**96**	**18.17**	**97**
1931	5.80	55	42	6.40	50	47	13.73	74	12.67	68
1932	6.32	60	39	9.17	72	56	16.41	88	13.43	72
1933	6.02	57	48	8.24	64	66	12.56	67	12.48	67
1934	5.31	51	52	6.76	53	67	10.13	54	10.71	57
1935	10.07	96	49	15.49	122	76	20.41	109	19.22	103
1936	5.22	50	43	8.30	65	68	12.13	65	12.60	67
1937	8.58	82	56	9.52	75	62	15.25	82	15.62	84
1938	13.34	128	70	13.97	110	73	19.11	102	20.05	107
Av. 1931-1938	**7.58**	**72**	**51**	**9.72**	**76**	**65**	**14.97**	**80**	**14.60**	**78**
Av. 1889-1938	**10.79**	**103**	**57**	**12.98**	**102**	**69**	**18.91**	**101**	**18.96**	**102**
Av. 1906-1938	**10.51**	**100**	**55**	**12.72**	**100**	**66**	**18.68**	**100**	**18.59**	**100**

Table. 2. Precipitation, Monthly and Crop Year Total at Huron, South Dakota, September, 1888 - August 1938*

Year Ended Aug. 31	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Total
	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
1889	0.19	0.29	0.34	0.18	1.26	0.93	0.19	3.41	3.04	1.04	3.51	0.66	15.04
1890	3.89	0.55	0.16	1.53	0.66	0.18	0.32	0.64	2.88	5.87	1.41	0.73	18.82
1891	0.32	0.61	0.38	0.68	0.07	1.32	1.64	3.45	0.44	8.08	1.01	1.43	19.43
1892	0.47	0.78	0.94	0.54	0.28	0.70	1.11	5.90	6.03	3.43	1.51	2.13	23.82
1893	0.59	2.36	0.77	0.36	0.85	0.59	1.58	4.68	2.49	0.67	3.34	0.59	18.87
1894	0.23	0.19	0.72	1.01	0.71	0.24	1.18	2.84	0.43	2.23	0.23	0.61	10.62
1895	2.42	2.22	0.35	0.10	0.91	0.71	1.03	2.03	1.83	2.57	1.63	2.82	18.62
1896	1.84	0.22	1.30	0.20	0.45	0.46	1.71	6.17	2.95	5.18	1.62	1.17	23.27
1897	2.36	1.70	1.97	0.36	2.87	0.52	1.53	4.03	0.46	3.81	2.32	2.69	24.62
1898	1.14	2.13	0.67	0.57	0.01	0.22	0.84	2.89	2.90	1.81	3.83	0.46	17.47
1899	1.31	1.01	0.23	0.11	0.26	0.33	1.13	1.04	2.96	2.91	0.90	2.06	14.25
1900	0.29	1.43	0.16	0.19	0.07	0.14	1.40	2.16	0.62	4.00	5.59	6.66	22.71
1901	2.39	1.47	0.17	0.06	0.13	0.28	0.79	0.86	1.78	6.46	0.64	2.50	17.53
1902	6.75	1.11	0.08	0.60	0.32	0.39	1.56	1.11	2.24	3.55	1.53	2.36	21.60
1903	0.19	0.76	0.29	2.12	0.08	0.31	1.02	1.26	1.99	2.54	1.61	1.09	13.26
1904	2.62	0.34	0.37	0.60	0.14	0.45	0.24	2.22	3.18	4.37	2.60	4.65	21.78
1905	0.26	1.71	0.10	0.44	0.36	0.27	0.48	0.67	6.44	7.80	5.27	3.72	27.52
1906	1.04	1.73	1.11	0.04	0.37	0.22	1.41	2.58	3.02	3.42	1.90	4.73	21.57
1907	3.14	3.19	0.70	0.69	1.22	0.44	0.45	1.15	3.58	2.88	3.24	0.16	20.84
1908	0.99	0.36	T	0.58	0.19	1.17	1.24	1.45	5.47	6.94	4.12	1.38	23.89
1909	1.39	2.82	1.50	1.00	0.60	1.55	0.21	0.61	3.84	0.95	2.42	2.37	19.26
1910	1.38	2.50	1.34	1.37	1.49	0.23	0.10	0.89	1.05	2.54	0.48	1.43	14.80
1911	1.00	0.52	0.17	0.29	0.17	0.74	0.45	0.57	2.97	1.82	3.26	2.82	14.78
1912	2.10	2.36	0.26	0.50	0.31	0.12	0.44	3.76	2.49	1.68	3.71	2.41	20.14
1913	1.40	0.23	T	0.20	0.03	0.23	1.24	1.81	4.53	1.06	3.82	2.35	16.90
1914	0.63	1.98	0.14	0.05	0.30	0.79	0.37	2.96	5.83	11.56	0.96	1.29	26.86
1915	3.43	2.35	T	0.30	0.45	1.43	1.05	1.80	2.05	4.50	4.14	1.55	23.05

Table. 2. (Continued)

Year Ended Aug. 31	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Total
	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
1916	1.69	1.06	0.25	0.73	2.00	0.55	0.89	1.16	3.83	3.51	1.56	5.70	22.93
1917	1.78	0.49	0.05	1.14	2.21	0.44	1.02	3.01	1.99	2.40	3.65	0.79	18.97
1918	1.87	0.07	0.26	0.30	0.71	0.65	1.11	1.94	3.62	2.64	6.36	2.73	22.26
1919	0.28	1.34	1.74	0.91	0.11	1.10	0.75	2.47	2.52	5.98	4.83	1.31	23.34
1920	0.77	1.08	1.77	0.29	0.30	0.65	1.72	3.05	4.73	6.27	5.39	1.74	27.76
1921	1.93	0.52	0.92	0.73	0.34	0.03	1.51	1.88	2.66	0.78	4.17	3.22	18.69
1922	4.55	0.79	0.42	0.42	1.34	1.20	0.86	0.54	2.47	3.24	1.15	0.39	17.37
1923	0.28	0.84	2.72	0.22	0.28	0.05	0.25	1.50	1.58	4.14	4.17	2.89	18.92
1924	1.95	0.63	0.31	0.22	0.09	0.58	1.52	0.92	1.15	7.78	2.55	4.50	22.20
1925	1.45	1.49	0.12	0.69	0.47	0.16	0.06	1.71	0.40	3.37	2.02	0.42	12.36
1926	0.39	0.23	0.62	0.28	1.57	0.04	0.13	0.09	2.77	2.17	3.22	1.49	13.00
1927	1.87	2.76	0.21	0.28	0.24	0.20	1.52	4.28	3.92	1.23	4.02	2.37	22.90
1928	1.11	0.49	0.49	1.20	0.02	0.59	0.28	1.27	1.25	6.50	2.28	2.14	17.62
1929	1.30	1.28	1.07	0.09	1.50	0.51	1.50	3.41	1.17	0.89	1.69	1.99	16.40
1930	2.79	1.62	0.36	0.08	0.40	1.24	0.69	1.74	4.48	1.71	1.15	3.58	19.84
1931	1.34	3.61	1.52	0.01	0.12	0.19	0.54	1.06	1.85	1.51	1.38	0.60	13.73
1932	1.52	1.19	0.56	2.15	0.39	0.14	1.29	1.52	2.67	1.98	0.15	2.85	16.41
1933	1.28	0.64	0.18	0.34	0.18	0.21	1.49	0.31	1.55	2.04	2.12	2.22	12.56
1934	1.56	0.05	0.22	0.53	0.06	0.11	0.84	0.03	0.65	2.52	2.11	1.45	10.13
1935	1.52	0.41	0.74	0.27	0.31	0.31	1.36	5.64	1.46	1.78	1.19	5.42	20.41
1936	0.22	0.31	0.45	0.77	0.52	0.88	0.68	1.62	1.09	1.66	0.85	3.08	12.13
1937	0.33	0.35	1.05	0.49	1.51	0.55	1.45	2.43	1.48	3.69	0.98	0.94	15.25
1938	0.80	0.35	0.43	1.01	0.43	0.65	1.47	5.78	3.29	1.28	2.99	0.63	19.11
Average 1889-1938	**1.53**	**1.17**	**0.61**	**0.56**	**0.59**	**0.52**	**0.95**	**2.21**	**2.60**	**3.45**	**2.53**	**2.19**	**18.91**
Average 1906-1938	**1.49**	**1.20**	**0.66**	**0.55**	**0.61**	**0.54**	**0.91**	**1.97**	**2.65**	**3.22**	**2.67**	**2.21**	**18.68**

* U. S. Weather Bureau.

Table 3. South Dakota Farm Prices for Various Crops, 1891-1938*

Year	Corn	Wheat	Oats	Barley	Rye	Flax	Wild Hay	All Hay
			Cents per bushel				Dollars per ton	
1891	26	73	27	41		81		
1892	25	57	22	34		87		
1893	25	47	22	28		85		
1894	27	44	22	33		118		
1895	25	45	17	28		84		
1896	15	49	13	15		55		
1897	12	68	13	17		80		
1898	20	63	19	24		80		
1899	21	54	18	26		95		
1900	25	57	18	28		139		
Av. 1891-1900	**22**	**56**	**19**	**27**		**90**		
1901	35	57	25	37		128		
1902	45	58	31	41		117		
1903	32	67	27	33		85		
1904	35	89	27	28		99		
1905	34	80	21	28		93		
1906	30	66	24	28		98		
1907	39	84	37	58		108		
1908	56	90	43	55	61	108		4.13
1909	54	95	39	48	59	134		5.05
1910	49	94	35	52	61	217		6.54
Av. 1901-1910	**41**	**78**	**31**	**41**	**60†**	**119**		**5.24†**
1911	45	89	35	81	70	209		8.26
1912	53	83	36	67	65	153		8.56
1913	46	74	32	46	53	119		6.06
1914	56	85	35	47	59	130	6.86	6.25
1915	58	103	35	52	86	153	6.81	6.05
1916	63	122	39	66	91	207	6.35	5.73
1917	114	187	55	104	146	294	8.76	7.72
1918	125	199	65	107	162	359	11.52	10.41
1919	127	217	60	97	132	412	15.08	13.23
1920	111	198	60	96	146	291	13.30	12.62
Av. 1911-1920	**80**	**136**	**45**	**76**	**101**	**233**	**9.81†**	**8.49**
1921	33	101	22	35	90	149	7.18	6.16
1922	41	93	26	37	60	201	7.49	6.27
1923	56	86	30	41	53	219	8.21	6.58
1924	71	110	39	57	69	212	7.28	7.46
1925	80	137	34	59	92	233	8.08	8.49
1926	61	129	33	49	75	201	9.60	10.54
1927	66	116	38	59	78	190	9.32	9.83
1928	69	100	36	59	82	191	6.58	6.85
1929	71	99	36	48	79	269	7.68	7.95
1930	59	67	27	37	48	177	6.98	7.28
Av. 1921-1930	**61**	**104**	**32**	**48**	**73**	**204**	**7.84**	**7.74**
1931	41	46	20	25	23	113	6.38	6.82
1932	27	36	13	21	22	87	6.05	6.37
1933	25	55	21	27	35	142	4.39	4.59
1934	59	84	43	57	57	165	11.21	11.43
1935	74	91	32	49	47	147	10.62	10.79
1936	69	105	32	53	56	180	6.40	7.12
1937	91	130	31	54	54	172	7.61	8.20
1938	41	62	18	32	39	162	4.28	4.62
Av. 1931-1938	**53**	**76**	**26**	**40**	**42**	**146**	**7.12**	**7.49**
Av. 1891-1938	**51**	**90**	**31**	**47**	**72†**	**157**	**8.16†**	**7.68†**

* Yearly averages, weighted by monthly marketings.

† Average for years reported.

Source: S. D. Farm Prices (1890-1937) Agr. Exp. Sta. Bul. 317.
S. D. Agr. Statistics, Annual Report, 1937, 1938, U.S.D.A.

Table 4. South Dakota Farm Prices for Various Livestock and Products, 1891-1938*

Year	Beef Cattle	Hogs	Sheep	Chickens	Eggs	Wool	Butterfat
	Dol. per 100 lb., live wt.			Ct. per lb., live wt.	Ct. per doz.	Ct. per lb.	Ct. per lb.
1891	2.97	3.67			12		
1892	2.42	4.04			12		
1893	2.47	5.42			12		
1894	2.33	3.84			9		
1895	2.34	3.20			9		
1896	2.23	2.53			8		
1897	2.46	2.81			8		
1898	2.86	3.00			8		
1899	3.02	3.10			11		
1900	3.33	3.86			9		
Av. 1891-1900	**2.64**	**3.55**			**10**		
1901	3.15	4.25			10		
1902	3.11	5.47			13		
1903	2.74	4.99			13		
1904	2.58	4.25			14		
1905	2.87	4.51			14		
1906	2.91	5.51			13		
1907	2.86	5.44			13		
1908	3.04	4.85			13		
1909	4.25	6.45		8.8	18		22
1910	4.61	8.02	4.54	9.0	17	19	24
Av. 1901-1910	**3.21**	**5.37**			**14**		
1911	4.25	5.90	3.61	8.5	15	15	21
1912	5.41	6.59	4.18	8.8	18	19	24
1913	6.28	7.34	4.61	9.3	16	15	25
1914	6.53	7.26	4.76	9.8	17	17	24
1915	6.16	6.20	5.20	9.4	17	23	25
1916	6.88	8.17	6.44	10.9	19	29	28
1917	8.52	13.81	9.87	13.9	29	52	36
1918	9.90	15.80	10.30	17.4	31	57	43
1919	9.89	16.43	8.61	18.5	35	52	53
1920	8.15	12.34	7.12	19.5	37	25	54
Av. 1911-1920	**7.20**	**9.98**	**6.47**	**12.6**	**23**	**30**	33
1921	5.18	7.13	4.17	15.7	21	14	32
1922	5.77	8.12	6.10	14.4	20	31	31
1923	5.95	6.49	6.38	14.2	20	34	39
1924	6.16	6.83	7.12	14.4	20	33	39
1925	6.83	10.73	8.18	15.6	25	37	41
1926	6.89	11.53	6.78	17.4	24	31	41
1927	7.98	9.15	7.42	16.5	20	32	43
1928	10.31	8.31	7.79	18.0	24	37	45
1929	10.01	9.20	7.16	17.7	24	30	44
1930	8.07	8.50	4.42	13.9	17	19	35
Av. 1921-1930	**7.32**	**8.60**	**6.55**	**15.8**	**22**	**30**	**39**
1931	5.54	5.39	2.77	12.4	13	12	26
1932	4.19	2.89	2.03	8.5	10	7	19
1933	3.59	3.12	2.41	6.4	10	23	20
1934	3.97	3.65	2.85	8.6	12	19	24
1935	6.83	8.23	4.09	13.2	20	20	28
1936	6.47	8.95	4.07	11.9	17	26	33
1937	7.75	9.35	4.17	13.7	17	30	33
1938	7.04	7.54	3.44	12.1	16	18	28
Av. 1931-1938	**5.67**	**6.14**	**3.22**	**10.9**	**14**	**19**	**26**
Av. 1891-1938	**5.19**	**6.70**	**5.54†**	**13.0†**	**17**	**28†**	**34†**

* Yearly averages, weighted by monthly marketings.
† Average for years reported.
Source: S. D. Farm Prices (1890-1937) Agr. Exp. Sta. Bul. 317.
S. D. Agr. Statistics, Annual Report, 1938, U.S.D.A.

Table 5. Organization of Minimum Sized Units Suggested by 36 Operators in Vernon Township and 32 Operators in Richland Township, Beadle County, South Dakota

Operators Suggesting Size Unit		Average Acres Suggested Per Farm			Average Number of Livestock Suggested Per Farm						
		Total	Cropland	Grass	Breeding Cows	Brood Sows	Brood Mares	Others Horses	Ewes	Chickens	Turkeys
No.	Pct.	Acres	Acres	Acres	Number	Number	Number	Number	Number	Number	Number
					VERNON						
5	14	160	96	64	6	4	1	3	28	155	2
25	69	320	201	119	13	7	2	4	14	121	5
2	6	480	190	290	22	8	4	2	15	200	12
4	11	640	328	312	28	9	4	2	5	89	5
					RICHLAND						
8	25	160	99	61	9	5	1	3	5	169	1
20	63	320	206	114	14	9	1	3	15	122	2
2	6	480	320	160	10	12	1	4	70	100	2
2	6	640	360	280	22	20	2	2		150	

Table 6. Standards Used for Calculating Budgets
Section A.—Yield per Acre and Tractor Hours, Seed and Twine Required per Acre

Crop	Yield per Acre*			Tractor Hours†	Seed Used	Twine Used‡	Threshing Charge
	High	Medium	Low	Acre	Acre	Acre	Bu.
Wheat	12 Bu	9 Bu	6 Bu	1.8	1 Bu	2 Lbs	.06
Oats	28 Bu	21 Bu	14 Bu	1.8	1.5 Bu	2 Lbs	.03
Barley	20 Bu	15 Bu	10 Bu	1.8	1 Bu	2 Lbs	.04
Rye	16 Bu	12 Bu	8 Bu	.5	1 Bu	2 Lbs	
Corn Grain	20 Bu	15 Bu	10 Bu	2.6	⅛ Bu		
Sorghum fodder	1⅓ T	1 T	⅔ T	3.6	9 Lbs§	1¼ Lbs	
Tame Hay	1⅓ T	1 T	⅔ T	1.5	¶		
Native hay	⅔ T	½ T	⅓ T	.5			
Tame pasture				1.0	¶		

* These yields were arrived at after a study of information secured from farmers, the county yields as reported by the Crop and Livestock Reporting Service, the AAA committeemen's estimates of wheat yields, and production obtained on the Experiment Substation farm at Highmore. "High" and "low" yields do not represent extreme variations.

† Tractor cost for fuel, oil and grease was estimated to be 30 cents per hour. This includes all operations connected with crop.

‡ Twine was figured at 9 cents a pound.

§ At 2¼ cents per pound.

¶ Seed for tame hay and pasture was estimated to be 35 cents per acre.

Table 6. (Continued)

Section B.—Annual Feed Requirements per Head of Livestock*

Livestock	Grain	Roughage	Native Pasture†
	Pounds	Pounds	Acres
Horses	2,500	5,000	5
Milk cows‡	1,000	6,000	5
Beef cows	250	4,000	5
Yearlings	200	3,000	3.25
Calves	300	1,500	1.25
Bull	500	4,000	5
Sow and litter	7,500		1
Laying hens (100)§	7,650 1,350 Supp.		
Baby chicks (100) to 26 weeks	2,430 270 Supp.		

* These standards were obtained from the Animal, Poultry, and Dairy Husbandry Departments of South Dakota State College.
Grain and roughage requirements for all livestock except poultry were calculated for each year on the basis of livestock inventoried Nov. 1 of that year. Feed requirements for poultry were calculated on average inventory which was 80 percent of the number on hand at the beginning of the year, Nov. 1.

† One acre of "tame pasture" was figured as equal to two acres of "native pasture". Fields are pastured after harvest in addition to grain acreage.
Pasture requirements for each year were calculated for the number of horses,cows, yearlings, bulls and sows inventoried at the beginning of that year (Nov.1). Pasture requirements for calves were calculated on the number born during the year. (This number corresponds to the number inventoried on Nov. 1 of the following year—see table 6, section B in text.) Calves inventoried Nov. 1 would be yearlings when pasture season arrived and pasture requirements were calculated accordingly.
Yearlings inventoried on Nov. 1 were heifers (18 months old) which would calve the following spring at 24 months. Since some operators might want heifers to calve at 30 months of age, an additional pasture season was figured for yearlings using the same pasture requirements as cows.

‡ A 175-pound butterfat production per cow was used.

§ Egg production was estimated to be eight dozen per hen.

Section C.—Prices of Crops, Livestock, and Livestock Products*

Crop	Low	Medium	High	Livestock and Product	Low	Medium	High
	Dol.	Dol.	Dol.		Dol.	Dol.	Dol.
Wheat, bu†	.50	.75	1.00	Cull cows, 100 lbs	2.00	3.00	4.75
Oats, bu	.24	.32	.44	Long yearlings, 100 lbs	4.75	7.00	9.25
Barley, bu	.32	.48	.64	Calves, 100 lbs	5.50	7.00	9.50
Corn, bu	.37	.56	.74	Hogs, 100 lbs	4.67	7.00	9.33
Sorghums grain, bu	.33	.50	.67	Old sows, 100 lbs	2.70	4.00	5.30
Native hay, ton	3.00	5.00	7.00	Chickens, lb	.08	.12	.16
Tame hay, ton	4.00	6.00	8.00	Butterfat, lb	.17	.25	.33
Sorghum fodder, ton	3.00	5.00	7.00	Eggs, doz	.10	.15	.20

* These prices were established after a study was made of past prices and price relationship.

† Wheat fed was inventoried at a cent per pound.

Section D.—Weights at which Livestock was Marketed*

Livestock	Weight
	Pounds
Old cows	1,000
Long yearlings	650
Pork per litter	1,200
Poultry	5

* These weights were established arbitrarily after consultation with individuals who were familiar with the agriculture of the area.

Section E.—Machinery*

Item	Orig. Cost Dol.	Est. Life Yrs.	Depreciation Dol.	Item	Orig. Cost Dol.	Est. Life Yrs.	Depreciation Dol.
Tractor—2 plow	1,000	10	100	Rake	50	16	3
Tractor plow	110	9	12	Stacker	100	14	7
Disc	125	15	8	Sweep rake	30	15	2
Harrow	45	20	2	Feed grinder	30	15	2
Grain drill	200	18	11	Wagon	100	24	4
Grain binder	350	16	22	Manure spreader	150	14	11
Corn planter	75	15	5	Harness set	50	10	5
Corn cultivator	110	15	7	Cream sep.	100	15	7
Mower	100	15	7				

* Assumed to be necessary for the 480 acre farm. This "base" was adjusted to conform to needs of the smaller and larger farms. Machinery repair per year was estimated to be 2 percent of original cost, 1937 prices. For calculating capital investment, machinery was inventoried at one half its original cost.

Section F.—Livestock Inventory Values

Livestock	Value
	Dollars
Horse	75
Cow, average	45
Yearling, 18 months	45
Bull	150
Calf, 6 months	20
Chickens, per 100	50
Sow	15

Section G.—Miscellaneous Expenses

Taxes:	
1 percent of livestock and equipment investment	
Veterinary Expense:	
Hogs per litter	$ 1.00
Other livestock per animal unit	.25
Labor:	
Hired labor per day	1.50
Board for hired labor per day	.50
Farm Auto and Trucking Expenses per year:*	
160 Acre farm	60.00
320 Acre farm	80.00
480 Acre farm	125.00
640 Acre farm	160.00
Rent (Unless otherwise stated)	
Sorghum, per acre	1.00
Tame hay or pasture, per acre	1.00
Native hay or pasture, per acre	.50
Farmstead, etc.	1.00
Grain crops	⅓ of crop

* Does not include portion chargeable to household.

Table 7. Tenant's Current Cash Operating Expenses on a 480-Acre Farm*

Item	Years									
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
	Dollars									
Cash rent	132	122	128	144	166	174	182	190	190	190
Seed	6	4	7	12	19	22	25	28	28	28
Feed†	348	375	448	459	459	459	459	459	459	459
Tractor expense	199	194	193	193	193	187	186	185	185	185
Twine and threshing	150	156	147	136	120	115	108	103	103	103
Equipment repairs	54	54	54	54	54	54	54	54	54	54
Auto and truck	125	125	125	125	125	125	125	125	125	125
Veterinary	6	7	12	15	16	17	17	18	18	18
Baby chicks	35	35	35	35	35	35	35	35	35	35
Taxes	20	22	23	26	28	30	30	32	32	32
Miscellaneous	50	50	200‡	50	50	50	50	50	50	50
Total	1,125	1,144	1,372‡	1,249	1,265	1,268	1,271	1,279	1,279	1,279

* Breakdown of item 1, section D, Table 6, "Current Operating Expenses."

† Includes commercial feed as follows: chicken mash, $48, and chick starter,$25.

‡ Includes bull purchased for $150; no bull owned prior to this time.

Table 8. Tenant's Assets on a 480-Acre Farm, Nov. 1*

Item	Years									
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
	Dollars									
Machinery	1,362	1,362	1,362	1,362	1,362	1,362	1,362	1,362	1,362	1,362
Livestock	688	795	960	1,250	1,425	1,600	1,685	1,790	1,790	1,790
Seed	141	148	123	118	102	97	90	84	84	84
Feed	605	1,198	1,654	1,932	2,086	2,228	2,285	2,315	2,318	2,320
Total	2,796	3,503	4,099	4,662	4,975	5,287	5,422	5,551	5,554	5,556

* Breakdown of item 14, section D, Table 6, "Assets, beginning of year."