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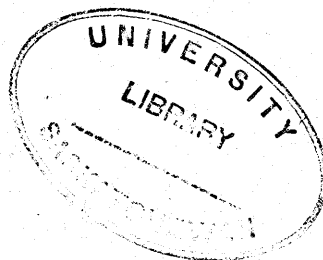
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A STUDY OF FARM ORGANISATION RELATING
TO THE
ADEQUACY OF FARM UNITS IN SOUTHWEST SASKATCHEWAN

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to the
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INTRODUCTION

The intensive settlement of the prairie areas of Western Canada resulted from a conjuncture of favourable circumstances.¹ Gradually increasing prices of wheat in the period prior to the World War, 1914-1919, and high prices during and immediately following the war presented a favourable opportunity for the production of the staple crop on which Western settlement was founded. The occurrence of a more favourable period of climate in the period after 1900, and the development of early-maturing and comparatively drought resistant wheat provided a more favourable basis of physical production than had hitherto prevailed. Improved transportation facilities for the export of grain, the development of credit facilities and other aspects of agricultural organisation, and improvements in power and equipment all encouraged a rapid progress of agricultural settlement. With the swinging of the tide of immigration from the United States towards the unoccupied areas of Western Canada after 1900, these factors combined to promote an extremely rapid settlement which quickly displaced the earlier use of land for large scale ranching.

1. Mackintosh, W.A. Prairie Settlement; The Geographical Setting, Canadian Frontiers of Settlement, MacMillan Co., Toronto. Vol. 1, Chapter IV.

Settlement and Agricultural Development of
Southwest Saskatchewan

The semi-arid regions of southwest Saskatchewan were opened up to homesteading more particularly after 1909.² Settlement was rapid from this date up to the period of the World War. It continued in significant proportions after the World War and was augmented by a further settlement in a number of areas just prior to 1930.

The development of settlement is reflected by the changes in population for respective census periods. These population changes for census divisions 3, 4, 7 and 8, which include all of the southwest corner of Saskatchewan are indicated by Table I. In 1901 the four census districts had a total population of 8,998. By 1911 this figure had already increased to 82,325. The 1911 figure more than doubled between 1911 and 1921, and there was a further increase from 168,198 to 187,598 between 1921 and 1931.

Table I Population Changes for Selected Census Divisions, Saskatchewan, 1901 to 1941.*

Census Division	1901	1911	1921	1931	1941
3	467	14,363	38,900	46,881	38,648
4	1,324	10,497	23,198	28,126	22,300
7	3,417	39,896	60,433	63,230	53,852
8	3,790	17,569	45,667	49,361	42,845
Total	8,998	82,325	168,198	187,598	157,645

* Census of Canada 1931 and 1941

2. Ibid., p. 125

The establishment of settlement was aided by a continuance of favourable circumstances which provided a succession of profitable wheat crops. Table II shows the yields for the south central and southwestern crop districts of Saskatchewan for the years 1913 to 1930. Yields were moderately good throughout the period apart from the years 1918 and 1919. Variation of yields within the Brown soil zone as between the respective crop districts, notably for the year 1914, are indicative of sporadic periods of crop failure for more local areas.

Table II Wheat Yields for the South Central and Southwestern Crop Districts, Saskatchewan, 1913 to 1930*

Year	District No. 3	District No. 4
	South Central	Southwestern
	Yield per acre	
1913	22.0	17.0
1914	13.0	2.0
1915	26.2	31.0
1916	14.3	18.1
1917	12.5	12.2
1918	8.1	4.7
1919	5.8	3.5
1920	11.0	9.9
1921	14.1	8.6
1922	24.2	18.7
1923	19.5	16.7
1924	13.9	6.8
1925	17.7	9.8
1926	16.5	8.8
1927	17.3	26.9
1928	25.8	27.1
1929	6.8	13.2
1930	8.0	13.1

* The Annual Reports of the Department of Agriculture, Saskatchewan, for the years 1914, 1916 and 1931.

During the period of relatively favourable wheat prices up to 1930 farmers were able to continue successful production despite occasional low yields. However, the conjuncture of low wheat prices and a series of abnormally low yields in the 1930's created serious financial difficulties for farmers and caused a considerable abandonment of settlement.³ Table III, which indicates the number of occupied farms for census districts of southwest Saskatchewan, shows a reduction in farm numbers from 32,742 in 1931 to 29,994 in 1936, with a further reduction to 29,439 in 1941.

Table III Numbers of Occupied Farms for Census Divisions of Southwest Saskatchewan, 1926 to 1941.*

Census Division	Census Years			
	1926	1931	1936	1941
3	7,928	8,939	8,101	8,065
4	5,478	6,347	5,538	5,171
7	8,196	8,556	7,747	7,858
8	8,412	8,900	8,608	8,345
Total	30,014	32,742	29,994	29,439

* Compiled from Census of Saskatchewan.

The difficulties of settlement experienced during the 1930's placed an abrupt check on the optimism which had accompanied the earlier period of settlement. It demonstrated some of the errors of settlement which had been perpetrated on the basis of a limited knowledge of conditions

3. The Wheat Economy, G.E. Britnell, Political Economy Series, No. 4., University of Toronto Press and The Canadian Institute of International Affairs, Table XXII, p. 78.

and lack of conservative foresight in appraising the possibilities of the southwest area.⁴ On the one hand it showed that the all-embracing expansion of the crop-land area had been made with little regard for the long-run suitability of various areas for settlement. On the other hand, it demonstrated some serious limitations of the type of settlement which had been attempted in the area.

Physical Characteristics of Southwest Saskatchewan

The economic characteristics and problems of settlement in southwest Saskatchewan are related very largely with the physical characteristics of the area.⁵ The predominant physical characteristic is a rigorous climate marked by a scanty and highly variable rainfall. In this respect the area embodies the abnormal hazard of a high variability of production operating near the margin of successful production.

Climate

Rainfall deficiency is the important limiting factor in the welfare of farmers in the region of southwest Saskatchewan. Agricultural practices in the region are concerned primarily with the conservation of the available moisture supply. The total annual precipitation ranges from 10 to 15 inches for the greater part of the area. Seasonal precipitation including that occurring from

4. Ibid., p. 37 last paragraph and p. 38 first paragraph.

5. Ibid., pp. 1-10.

August to October in the previous fall, and from April to July of the crop season, ranges from 8 to 12 inches. Variations of both the annual and seasonal rainfall about these averages are extreme as shown by the records of precipitation at Swift Current, Chaplin and Nashlyn in Table IV. It is notable that a significant proportion, approximately one-half of the total yearly precipitation, falls during the growing season April 1 to July 31.

The effectiveness of moisture for crop production is dependent to a considerable extent on accompanying conditions of temperature which affect the rate of moisture evaporation and crop growth. The high temperatures prevalent in the southwest and the accompanying high wind velocities result in a considerably greater evaporation of moisture than in other areas of the Province. Also, while difficult to measure, the searing effects of extremely high temperatures with hot dry winds which cause rapid evaporation in June and July in some years are recognised to have a seriously deleterious effect on the development of cereal crops in the area. The incidence of such 'critical' temperatures is considerably higher in the area than in other parts of the Province and may account significantly both for the lower yields and the more extreme variability of yields in the area.

Temperatures as they relate to the length of the growing season are generally favourable for the southwest.

Table IV Precipitation in Southwest Saskatchewan for Swift Current,
Chaplin and Nashlyn, 1914 to 1940.*

Year	Total Annual			Total Seasonal April to July			Total Crop Season August to October, April to July		
	Swift Current	Chaplin	Nashlyn	Swift Current	Chaplin	Nashlyn	Swift Current	Chaplin	Nashlyn
1914	12.47	12.47	10.35	3.65	5.06	2.43	6.38	9.03	4.76
1915	14.27	14.92	13.82	9.38	10.67	10.19	14.55	14.57	15.96
1916	23.98	21.60	14.89	11.55	11.67	8.39	14.29	14.63	10.83
1917	11.85	11.41	9.14	3.86	6.21	2.58	8.97	11.21	6.00
1918	12.27	12.68	5.91	4.36	6.30	1.19	7.95	10.20	3.85
1919	12.33	13.81	7.58	4.16	7.49	4.09	7.53	9.09	6.61
1920	11.56	16.74	9.11	6.90	9.59	5.40	11.71	13.22	7.34
1921	14.93	15.91	11.33	7.30	5.61	7.56	10.39	8.96	9.19
1922	14.27	10.95	10.24	9.75	6.34	6.56	15.99	14.41	8.31
1923	16.38	15.72	9.98	12.40	9.48	8.48	14.78	11.97	10.13
1924	16.73	18.12	9.22	7.57	9.31	5.86	9.24	12.58	6.61
1925	14.33	11.22	14.35	6.58	6.87	7.41	12.47	12.68	8.77
1926	15.88	14.16	10.23	7.60	5.67	3.69	12.97	9.12	8.91
1927	21.13	18.32	17.51	12.32	10.40	11.74	17.57	15.27	16.62
1928	11.55	11.68	7.37	8.64	9.70	3.83	14.44	13.12	5.97
1929	14.86	8.46	11.34	7.34	3.41	6.71	8.46	4.66	8.80
1930	13.54	10.48	9.23	6.96	5.92	5.54	9.17	7.47	7.79
1931	11.87	9.05	7.91	4.53	3.56	5.63	9.81	6.72	8.02
1932	19.04	17.16	10.56	10.84	10.14	5.97	15.51	14.58	6.80
1933	17.89	11.88	11.37	6.77	5.52	5.89	11.57	10.79	8.38
1934	11.36	9.66	7.07	6.80	6.12	3.50	14.19	11.09	6.79
1935	17.34	13.89	9.83	9.71	7.22	6.53	12.34	9.63	9.11
1936	11.70	9.52	7.72	4.99	4.90	2.50	7.75	8.52	3.37
1937	8.31		10.84	2.59	4.55	4.89	5.49	6.07	6.90
1938	14.20		13.09	5.40	5.10	7.67	7.90	6.46	10.72
1939	15.30		14.55	11.50	7.40	8.46	15.50	10.50	10.06
1940	11.10		13.91	7.00	6.60	7.41	8.50	7.90	10.18
Average	14.46	13.48**	10.68	7.42	7.07	5.93	11.31	10.53	8.40

* Compiled from Tables 8, 9 and 10 of Rainfall Records for Saskatchewan, University of Saskatchewan,
Bulletin No. 18, pp. 16-26.

** Average for 23 years only.

Length of frost-free season does not impose any limiting effect on spring-sown grains. Existing varieties of wheat, oats and barley normally mature without difficulty within the ordinary season.

Soils

Southwest Saskatchewan is located within the Brown soil zone or the short-grass prairie region of the Province. The soils of this zone reflect the effects of a relatively low moisture efficiency in the forms of a short-growing and relatively sparse natural vegetation, and a shallow layer of organic matter in the soil profile.

Within the Brown soil zone local differences in elevation are associated with differences in climate and vegetation. Also, the soil profiles vary with respect to texture, as determined by the geological origin of the soil parent materials. Differences in topography and drainage contribute to further variations so that the soils of the area reflect a wide range of fertility and productivity.

Apart from the soils of the Cypress Hills and Wood Mountain which developed under conditions of higher soil moisture efficiency and are classed with the Dark Brown soils, the soils of the region are grouped into eight associations. These eight associations have a wide range of characteristics which affect their suitability for crop production.⁶ Table V shows an estimated division of the total

6. Soil Survey of Southern Saskatchewan from Townships 1 to 48, Soil Survey Report No. 12, University of Saskatchewan, p. 254.

area in the Brown soil zone into the various soil associations. The Haverhill association is the most extensive, but in terms of productiveness embodies mainly medium classes of soils of varying topography. The Sceptre association on the basis of the important relationship between productivity and texture has the highest rating in the Brown soil zone, and includes a high percentage of arable land.⁷ The Fox Valley soils, especially the silty clay group, although of low drought resistance, are quite satisfactory for wheat production where the topography is favourable. They are rated second to the Sceptre group for crop production. Haverhill and Wood Mountain clay-loam soils are classed as being moderately good, while Robsart clay loam is only fair. Echo clay loam and loam are poor, while the associations Chaplin and Hatton represent very poor soils.

Table V Approximate Acreages Occupied by Soil Associations, and Miscellaneous Soils for the Brown Soil Zone.^{*}

Association	Total Area
Sceptre	2,140,000
Fox Valley	1,131,600
Haverhill	8,534,100
Wood Mountain	753,800
Robsart	178,600
Echo	1,557,200
Chaplin	577,200
Hatton	953,500
Miscellaneous soils	4,096,600
Total Brown soil	19,922,600

^{*} Ibid., pp. 254-255

7. Ibid., pp. 51, 53-79, and Table 17, p. 196.

It is estimated that of the 20.0 million acres in the total land area of the Brown soil zone some 6.0 millions are arable and approximately 14.0 millions are non-arable.⁸

Topography

Southwest Saskatchewan lies on the third prairie level in the Canadian section of the Interior Continental Plain. It is bounded on the East by the Missouri Coteau, a range of rounded hills which lie roughly West of a line joining Moose Jaw and Weyburn. The South Saskatchewan River is approximately the north boundary of the area.⁹

The third prairie level slopes towards the East and North. That part of it which lies in Saskatchewan has an elevation of from 2,000 to 3,000 feet. Rivers and streams are relatively swift-flowing with the banks of their valleys high, sloping, and cut by deep gullies. The surface of the region varies from undulating to hilly. While the greater part of the area does not hinder cultivation the proportion of the area affected by difficult topography is considerably greater than for other parts of the Province.

There are two prominent eroded remnants of old table lands in the area which rise from 1,000 to 2,000 feet above the surrounding country. These are the Cypress Hills and Wood Mountains. The elevation of these areas and their eroded character, associated with rough topography, makes them suited more particularly to ranching than to grain growing uses.

8. Ibid., Table 20, p. 213

9. Mackintosh, op. cit., p. 8.

Economic Characteristics of Southwest Saskatchewan

Type of Farming

The majority of farms in the southwest conform to a type which combines a main enterprise with some minor enterprises. The type of farming organisation of individual farms varies considerably, reflecting the operators' efforts to adjust themselves to variable and uncertain conditions of the area.

Foster F. Elliott in his study of types of farming in the United States, in commenting on the development of farming types, suggests: "Anyone who has even casually observed farming must have been impressed with the way in which it changes in character from one part of the country to another. In some cases these changes are gradual while in others they are abrupt, representing a distinct break in the kinds of agriculture followed. These variations in some cases may be accidental. In the main, however, they probably result from the efforts of farmers to adjust themselves to their physical and economic environment".¹⁰

Wheat production is the important major enterprise in the area of study, but is supplemented by limited acreages of other cereal crops and by livestock which have a varying adaptation to individual farms. By virtue of the predominance of wheat production, the area constitutes a relatively highly specialized wheat growing area.

10. Elliot, Foster F., Types of Farming in the United States, United States Department of Commerce, Census of Agriculture, 1933, p. 1.

The comparative crop acreages and livestock numbers per farm for the four southwest census divisions are shown in Table VI. These show averages for all census divisions of 143.3 acres of wheat, 7.1 acres of barley and 19.2 acres of oats per farm in 1941. Livestock numbers averaged 8.9 cattle, 5.0 sheep and 4.1 hogs.

Table VI Crop Acreages and Livestock Numbers per Occupied Farm, by Census Divisions 1941.*

Census Division	Crop Acreages per Farm			Numbers of Livestock per Farm		
	Wheat	Barley	Oats	Cattle	Sheep	Swine
3	138.7	7.9	21.1	7.6	2.4	5.2
4	128.4	3.8	18.8	13.0	8.1	3.4
7	116.2	11.4	23.7	8.4	2.1	4.0
8	189.9	5.1	13.1	6.7	7.3	3.9
All Divisions	143.3	7.1	19.2	8.9	5.0	4.1

* Census of Saskatchewan, unrevised, 1941.

The predominance of wheat production in southwest Saskatchewan arises from the combination of suitable soil qualities and topography, and the semi-arid climate which favour wheat production more than the other cereal grains. The suitability of areas for settlement is thereby governed primarily by this comparative suitability in terms of wheat production. Oats and barley acreages on farms relate closely to the needs for coarse grain production for livestock enterprises.

The limited numbers of livestock on farms indicate an adaptation of livestock enterprises primarily as supplementary or complementary enterprises to wheat production. Small livestock enterprises to meet family needs are common to most farms. Larger enterprises in the case of cattle and sheep are related to the presence of waste pasture areas allowing low costs of production. Within the region there are some areas supporting large-scale range production of cattle and sheep. These increase the average numbers of livestock per farm indicated for the area above the actual figures which apply to farming areas.

Size of Farms

The sizes of farms in the Brown soil zone represent a conditioning of the very limited sizes of holdings established under the original settlement to the factors for the area which determine a requirement of generally extensive farm holdings. These factors of low yields, adaptability to mechanisations, limited cultivation requirements, and others, which determine a general economy of large scale operation, exert an outward pressure on farm boundaries and have resulted in a gradual increase in the average size of farm units since the time of settlement. At the same time, under the prevailing conditions of settlement, abandonment and other factors, they have resulted in an extreme diversity in farm size with an accompanying extreme variation in the capacity of individual farm units.

Table VII summarises the comparative sizes of farms by census divisions. The average size of farm for the four census divisions of southwest Saskatchewan in 1941 was 576 acres, indicating a typical farm unit of about one-section sizes. This area comprised approximately 337 acres of improved and 239 acres of unimproved land. The improved area, comparable to little more than a well-developed half-section farm, still suggests a very limited size of farm unit in relation to the conditions prevailing for the area.

Table VII Average Areas of Farms by Census Divisions for Southwest Saskatchewan, 1941.

Census Division	Total Area ★	Improved Area★★	Unimproved Area★★
Acreages per farm			
3	509.3	332.6	176.7
✓ 4	732.2	312.6	419.6
7	488.1	334.8	153.3
8	576.4	368.3	208.1
All Divisions	576.5	337.1	239.4

★ Census of Saskatchewan, unrevised, 1941.

★★ Estimated for 1941 on the basis of the condition of farm land by census divisions 1936.

Variation in sizes of farm are accounted for by a large number of individual factors. Such factors have perhaps had an intensified effect in southwest Saskatchewan, where the distribution of farm sizes shows a general extreme between small and large sizes of holdings. The size distribution of farms in southwest Saskatchewan is shown by census divisions in Table VIII. The census method of enumeration exaggerates the numbers of individual farm holdings so as to indicate

both a smaller average size of farm and a larger number of small-sized units than actually prevail. Nevertheless, the size distribution of farms given by the Census is indicative of a comparatively large proportion of farms of very limited size. It suggests the serious disadvantages associated with some farms in attaining standards comparable to those attainable by other units.

Table VIII Distribution of Farms According to Size, by
Census Division, Southwest Saskatchewan, 1936.*

Census Division	Up to 299 acres	300-479 acres	480-639 acres	640 and over acres
3	1,476	3,046	1,396	2,183
4	919	1,613	900	2,106
7	1,721	2,710	2,859	2,012
8	1,555	1,304	1,403	2,791
All Divisions	5,671	8,673	6,558	9,092

* Census of Saskatchewan, 1936.

Crop Experience

The crop yield experience of individual farms reflects the influence of innumerable factors, many of them subject to a greater or lesser extent to the control of the individual operator. On the other hand, the crop experience of larger areas can be considered to reflect the underlying influence of uncontrollable factors in the form of climate, soil and other physical factors which determine the general level of productivity of the area.

In respect of the above, the crop experience of southwest Saskatchewan indicates it to be an area of comparatively low normal productivity. It also suggests it to be an area of excessively variable productivity, due chiefly to the large variations in crop season rainfall which occur. These features of physical productivity point to characteristics of high risks and instabilities in the farm business associated with low and highly variable incomes.

Table IX summarises the yield experience for southwest Saskatchewan as shown by Table II, along with the subsequent experience from 1931 to 1944. The average yield of wheat for crop district No. 3 in south central Saskatchewan from 1913 to 1944 was 13.0 bushels, and for district No. 4 in the southwest, 11.5 bushels. These figures compare with an average yield of 16.2 bushels for the Province as a whole during the period and indicate the generally lower level of physical productivity for the area. In so far as yields also show a significant relation to soil texture (see page 8) they suggest the extremely low productivity associated with areas of poorer soils.

Table IX also indicates the extreme variability of yields prevalent for the area. For the southwestern crop district the crop ranged from an almost complete failure in the year 1937, to a high of 27.1 bushels per acre in 1928. During the period of 32 years from 1913 to 1944, four crops averaged 20 bushels per acre or more. On the other hand, 12 crops during this period averaged less than eight bushels. For the seven

year period from 1922 to 1928 the average yield was 16.4 bushels. However, for another seven-year period from 1931 to 1937 it averaged only 5.48 bushels. In coinciding with a period of extremely low prices, this latter period resulted in extremely low incomes, accompanied by extreme hardship and serious abandonment.

Table IX Annual Wheat Yields for Crop Districts of Southwest Saskatchewan, 1913-1943.*

Year	District No. 3 South Central	District No. 4 South Western	Year	District No. 3 South Central	District No. 4 South Western
1913	22.0	17.0	1930	8.0	13.1
1914	13.0	2.0	1931	3.1	5.7
1915	26.2	31.0	1932	8.3	15.7
1916	14.3	18.1	1933	4.0	4.3
1917	12.5	12.2	1934	3.6	4.3
1918	8.1	4.7	1935	11.6	7.1
1919	5.8	3.5	1936	4.4	1.2
1920	11.0	9.9	1937	0.2	0.1
1921	14.1	8.6	1938	7.0	9.9
1922	24.2	18.7	1939	18.1	17.9
1923	19.5	16.7	1940	16.5	19.9
1924	13.9	6.8	1941	7.5	10.0
1925	17.7	9.8	1942	25.1	20.8
1926	16.5	8.8	1943	13.9	6.8
1927	17.3	26.9	1944	16.6	4.9
1928	25.8	27.1			
1929	6.8	13.2	Average	13.0	11.5

* Secretary of Statistics, Saskatchewan.

Submarginal Areas

The conditions of southwest Saskatchewan, which limit crop adaptations primarily to a single crop, and which determine closely the production obtainable from that crop, imply

basic differences in the abilities of areas to sustain desirable agricultural settlement. To permit satisfactory settlement on the basis of the predominantly adapted use, land must assure sufficient returns from production over a longer period of time to meet the costs of utilisation and to provide a minimum standard of return to the farm family. Failing such minimum return, the land becomes submarginal for effective settlement.

The characteristic of submarginality does not permit rigid definition. Land which is submarginal in terms of one type of use may have a different character under situations allowing an alternative type of use. Similarly, submarginality under one form of organisation of uses does not necessarily involve submarginality in terms of an alternative organisation of use. Also, estimates in terms of one set of economic conditions will be altered in relation to changed conditions. Further than this, any concept of submarginality involves a concept of minimum requirement of return which is difficultly defensible and may be subject to change under changing circumstances.

On the other hand, determinations of probable returns under commonly adapted forms of organisation and use, together with actual experiences of settlement, usually permit a reasonable estimate of comparative capacities of various areas for supporting desirable settlement. Based on such criteria, the area of southwest Saskatchewan indicates a relatively serious over-extension of settlement into areas affording limited

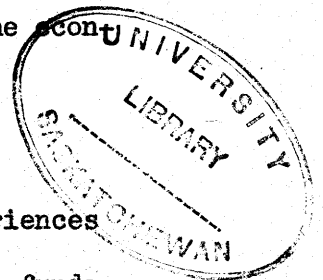
opportunities for successful settlement. This is suggested by a general land classification of a large area of south central Saskatchewan.¹¹ In this classification, covering a total of 56 municipalities comprising approximately 11.5 million acres, 60.7 percent of the area was classified as marginal or above, and 39.3 percent was classed as submarginal, based on its suitability for wheat production. The proportion of submarginal land varied from 5.4 percent to 93.3 percent of the total area for various municipalities. The combined area of marginal and submarginal land, in turn, varied from 10.9 percent of the total area to 99.4 percent.

The extensive areas of marginal and submarginal lands indicated for southwest Saskatchewan, large proportions of which remain settled at the present time, are indicative of the seriously low productivity of the area for sustaining successful agriculture. At the same time they demonstrate the serious errors of initial over-settlement which have served to increase both the extent and severity of the economic problems of the area.

Problem Characteristics

The characteristics of agriculture and the experiences of settlement in southwest Saskatchewan emphasize two fundamental aspects of economic problem associated with the area.

11. Spence, C.C., and Hope, E.C., An Economic Classification of Land in Fifty-Six Municipal Divisions, South Central Saskatchewan, Dominion Department of Agriculture, Marketing Service, Economics Division in Co-operation with the Department of Farm Management, University of Saskatchewan, Publication No. 728, October, 1941, pp. 15-16.



On the one hand they point to a resource problem related with limiting features of the resource pattern and of resource utilisation for sustaining settlement. On the other hand they focus attention on a problem of excessive instability. While closely inter-related with the resource problem, this phase of problem traces more directly to an association of general factors of instability with severe production instabilities determined by the climate and the type of farming adaptations of the area.

The apparent aspect of the resource problem can perhaps be best characterised as an insufficiency of resources, in the sense of an insufficient capacity of resources under existing utilisation to support present settlement. In this relation, however, it embodies several distinctive aspects which may have varying significance for the area as a whole and for individual parts of the area.

Thus, on the one hand, the apparent insufficiency of resources may reflect a problem of absolute inadequacy of resources. Such inadequacy may relate to an absolute inability of the existing scale of resources to support the prevailing population, irrespective of the degree and efficiency of utilisation achieved. The probable existence of a major problem in this form is suggested by the serious over-extension of settlement on areas of poor lands, by the comparatively limited size of farm units, and by the serious abandonments which accompanied more severe periods of crop failure. The incidence of the pro-

blem may remain severe for the area as a whole and probably shows a much greater severity for areas of poorer soils which may have experienced the greatest degree of over-settlement in the initial settlement process.

On the other hand, the apparent insufficiency of resources reflects problems of ineffective utilisation of resources related to aspects of under-utilisation and inefficient utilisation. The former aspect is associated with inadequate usage of existing resources. It relates to the existence of unused grazing areas, of vacant abandoned lands, and the under-utilisation of grazing lands, and of water and feed resources which are apparent in many portions of the area. The latter aspect on the other hand relates to a low efficiency of resource use in the form of a low return from resources under existing modes of utilisation. It is exemplified by maladjustments of land use, inefficient operating units, ineffective types of farm enterprises and by deficient cropping and livestock practices which are also common to the area in varying degrees. In an alternative form it is exemplified by practices of over-utilisation of certain resources which are contributing more or less seriously to the eventual depletion of productivity of respective resource.

A still further aspect of apparent resource insufficiency probably relates to an undesirable distribution of resources among various resource users. A problem aspect of this character is identifiable with the distribution of farm units in the area which combines many seemingly adequate farm units with a large number of apparently undersized units. It is also

indicated by the variable distribution of the land area among farms which in some cases has permitted fully desirable farm organisation and in other cases has placed severe limitations on the establishment of desirable types of farming.

While the major problem aspects of southwest Saskatchewan may perhaps be most easily interpreted in terms of general features of resource utilisation and characteristics of instability, the eventual mitigation of the problems rests to a major extent upon the limited phases of adjustment which may be effected in terms of re-organisations of individual farming units. Although the apparent character of the problems of the area suggest a requirement of broader types of adjustment in the form of settlement adjustments, improvements in the productivity of resources and other factors, a large phase of effective re-organisation of resource uses and attainment of desirable stability will rest with the development of more suitable forms of farm organisation on the part of individual settlers. Eventual adjustments of the settlement pattern to the capacity of resources will be dependent upon settlers building up desirable amounts and types of land areas in their respective operating units. The attainment of more complete and efficient use of land resources will rest with adjustments in types of farming and in the character of farm units which will permit the more complete and efficient utilisation of all land areas. Improved stability of production and settlement, in turn, will depend upon the improvements in types of farming,

and in efficiency and scale of operation effected by individuals through individual re-organisations of operating units.

The above features of farm organisation focus attention on the important relationship of farm unit organisation with the problem aspects of southwest Saskatchewan. They suggest the need for developing a concrete concept of desirable and adequate farm organisation as a basis for appraising more clearly the extent and severity of the problems of the area and the scope and requirements of needed adjustments. On the other hand they indicate a useful place for a concept of desirable farm organisation as a means of implementing and attaining satisfactory adjustments.

Objectives of Study

With consideration for the important relation of farm business organisation to the problems of southwest Saskatchewan the objective of this study is to examine the characteristics of farm organisation as they relate to the success of farming **in** this area. Three specific objectives may be defined as follows:

- (1) To examine the characteristics of farm organisation and their relationship with the success of farm businesses for the area.
- (2) With special reference to the characteristic of farm size, to measure the influences of farm organisation on the returns of farming under various conditions.
- (3) To determine standards of "adequate" farm organisation which might furnish suitable guides for appraising the problems of the area and obtaining desirable adjustments in farm organisation and land use.

Sources of Data and Method of Study

The data used in this study were obtained through farm business survey studies made by the Economics Division, Marketing Service, Dominion Department of Agriculture in co-operation with the Farm Management Department, under the auspices of the Provincial Land-Use committee. The studies represented a part of a larger study of the committee directed towards developing a program of land-use adjustments for south-west Saskatchewan.

The farm business surveys made by the Economics Division and Farm Management Department included two phases as follows:

- (1) A survey of livestock numbers and grazing land use in the two municipalities of Chaplin No. 164, and Webb No. 138.
- (2) A survey of farm businesses in a representative area of twelve municipalities.

The survey of livestock numbers and grazing land use was directed towards obtaining a complete inventory of livestock numbers in the areas concerned, a record of the kinds and amounts of lands used for grazing, and information on livestock practices and factors affecting livestock production. A total of 344 records were obtained for the two municipalities studied.

The survey of farm businesses was made in a representative area selected for study by the Land-Use committee and included the twelve municipalities listed in Table X.

Table X Rural Municipalities Included in the Saskatchewan Land-Utilisation Study, 1945.

Number	Name	Number	Name
133	Rodgers	163	Wheatlands
134	Shamrock	164	Chaplin
135	Lawtonia	165	Morse
136	Coulee	166	Excelsior
137	Swift Current	167	Saskatchewan Landing
138	Webb	168	Riverside

The survey comprised an enumeration of a partial business record designed to give information on various features of farm business organisation. The businesses included were selected so as to be representative of several groups of farms having different characteristics of organisation as follows:

<u>No.</u>	<u>Groups</u> <u>Description</u>	<u>Number of Records</u>
1	Small cropland area	33
2	Moderately large cropland area	23
3	Small cropland area with small live-stock enterprises	34
4	Small cropland area with moderately large livestock enterprises	15
5	Moderately large cropland area with small livestock enterprises	30
6	Moderately large cropland area with moderately large livestock enterprises	21

The data enumerated in the farm business records included a summary of the amounts of land in the farm unit and its present use, the record of crop yields, inventories of livestock, buildings and equipment, a record of expense items and labour,

and additional information on farm operation offering a guide to representative organisation and operating practices. The farm business year for the purpose of the study was taken as from July 1, 1944 to July 1, 1945.

For the purpose of studying the relationship of various features of farm organisation with farm returns, use was made of the budget method. This method provides for estimates of probable returns in terms of a complete budget of costs and returns held to be representative of particular circumstances and conditions. It was considered to afford a more practical basis of analysis than is given by alternative methods. The principal alternative method consists in the detailed analysis of relationships of costs and returns shown by complete business records of a representative sample of farms. This method is subject to the requirement of a large sample of records to ensure adequate representation of the highly variable factors and conditions encountered. In so far as yield and price conditions prevailing for any one business year or a limited period of years are rarely fully representative of conditions over a longer period of time, the method has severe limitations for interpreting probable income relationships for longer-time periods. The budget method, in contrast, allows reasonable selection of representative farms from a more limited sample of farms and gives a flexible basis for interpolating relationships in accordance with estimates of representative conditions.

Characteristics of Farm Organisation in
Relation to Southwest Saskatchewan

Farm organisation, with respect to the area of southwest Saskatchewan, relates to a highly variable character of organisation. Within this variable character, several features of organisation assume greater importance than others on the basis of the conditions which prevail for the area.

Aspect of Family Farms

Farm organisation concerns primarily the character of farm unit designated as the family farm. The individually operated farm, handled by the farm operator, with a limited amount of aid from family members and hired workers, constitutes the predominant unit of farm organisation. In view of its comparative adaptation and its historical stability it seems destined to remain as the predominant form of organisation for some time.

The predominance of the family type of farm unit is indicated by the distribution of the labour force of farms. The 139,287 farms indicated for the Province by the Census of 1936 included a total of 193,775 family workers. These included the operator and family members, so that family members in addition to the operator amounted to an average of only about 0.4 per farm. Hired workers totalled 132,321, including 11,421 permanent workers and 120,900 temporary workers. The total amount of hired work per farm amounted to an average of only eight weeks of labour. On this basis, allowing for the

fact that family members would not be fully employed in all cases, the average labour force of Saskatchewan farms consisted of about 1.6 man equivalents, made up by the operator, together with about 0.4 equivalents of family labour and 0.2 equivalents of hired labour. In view of the considerable reduction in farm workers which has occurred since 1936, the present situation would suggest an even greater dependence on operator and family labour than indicated above.

While characterised by the common term of family farm, the organisation of farm represented by the family unit remains highly diverse. The flexibility of the operator's labour allowed by different methods and efficiencies of application of labour, varying hours of work, and other factors, permits large differences in the size of business and kinds of enterprises handled. The presence or absence of family labour, the amounts of family labour available, and the extent and method of use of hired labour, allow major differences in the scale and combination of production followed. Variations in the types of equipment employed, particularly with the advent of newer forms of mechanisation, have accentuated severely the variations in organisation of individual units. Along with these factors, variations in managerial capacities and abilities of operators have determined further variations through limiting or reinforcing the influences of other factors.

Returns as Criterion of Organisation

To the extent that farm organisation relates primarily to the family farm unit, the desirability of a particular form of organisation is determined principally by its ability to provide for the satisfactory welfare of the farm family. While not wholly so, the welfare of the farm family depends largely upon the economic returns which are made available by the farm for family living and personal expenditures.

In terms of the above, desirable farm organisation can be defined primarily in relation to the income capacity of the farm unit. It permits a criterion of desirable organisation in terms of the capacity of such organisation to yield money returns.

Although suggesting a comparatively concrete standard, the criterion of income capacity remains subject to various qualifications related to a number of factors. In so far as it relates to conditions of high variability of income such as obtained for southwest Saskatchewan, satisfactory income capacity can only be interpreted in terms of a generally satisfactory level of income over a longer period of time. In this respect the use of income capacity as a criterion is subject to various uncertainties surrounding both the basis of estimate and the method of measuring probable longer-time returns.

At the same time the severe instabilities and uncertainties affecting farm returns in southwest Saskatchewan imply qualitative aspects of desirable farm organisation which are not

readily interpreted in terms of money returns. Under such variable conditions, desirable farm organisation implies characteristics which will help to withstand the shocks of severe instability and to mitigate the general effects of instability. This focuses attention, on the one hand, on such features as desirable scale and efficiency of organisation related to the ability to maintain minimum incomes and reserves in particular periods of prices and yields. On the other hand, it focuses attention on features of desirable combinations of production, related both to comparative returns and to relative stability of returns. It suggests some further uncertainties associated with a criterion of income capacity, owing to the complex relations of instabilities and risks and their extremely variable influences under different conditions.

Again, a criterion related to income capacity is affected by the highly variable factors to which the income capacities of individual farm units are subject, and the complex relation of farm organisation to income capacity. Differences in the productivity of land areas, in the grade and combination of other production factors and in the types of farming practices allowed under various organisations permit major differences in the income capacity attributable to a particular form of organisation. Differences in labour supply, equipment organisation, and the managerial capacities of operators, allow innumerable variations in type of organisation so as to allow difficult association of a particular income capacity with a particular

form of organisation. The factor of varying managerial capacity, in particular, gives a difficult basis for indicating desirable organisation in terms of income capacity for the individual farm operator. In the main, this suggests that the criterion of income capacity remains valid only with respect to general forms of organisation which can be associated with general grades of managerial capacity. In this way, it suggests that a consideration of farm organisation should be related principally to the common forms of organisation which have proven their adaptation to the capacities of considerable numbers of farmers in an area.

Among the additional limitations to which the use of a criterion of income capacity is subject, perhaps the more important concerns the problem of soil conservation as it relates to desirable farm organisation. Just as desirable organisation implies a basis of economic returns which will support the welfare of the farm family, it implies an ability to provide continuing returns for the maintenance of settlement over an indefinite period. The longer-time maintenance of desirable returns is determined primarily by the provision made for the effective conservation of soil resources. In this respect a criterion of desirable income capacity remains valid only in so far as it relates to organisation which may be considered to provide a reasonable basis of soil conservation. In view of the uncertain requirements which desirable

conservation implies, and the complex relation of various aspects of conservation to farm returns, this suggests a general limitation of income capacity in indicating the requirements of acceptable organisation. It suggests a need for general qualification of income capacity in terms of accepted conservation requirements.

The above factors do not obviate the use of income capacity as a criterion for appraising the desirability of various forms of farm organisation. Rather, they indicate the qualifications to which it is subject when used in particular applications. More particularly, they emphasize its limitations for appraising the complex variations associated with individual circumstances of organisation. Also they indicate its limitations for appraising aspects of organisation related to qualitative characteristics of returns and to soil conservation requirements which are reflected only partially in income capacity. In these respects, income capacity is established as a general standard, applicable only to the more significant relationships of organisation and the more important variations of circumstances affecting organisation. Within this general scope of application, and subject to its broader limitations and qualification it remains the central criterion for evaluating desirable characteristics of organisation.

In terms of the central position of income capacity in guiding an evaluation of farm organisation, desirable organisation may be interpreted mainly as the form of organisation

which permits returns which allow a generally satisfactory standard of welfare for the farm operator and his family. Returns in such connection relate primarily to the average levels of returns obtainable over a longer-time period reflecting the variations to which returns are subject. However, desirability of organisation also comprehends such features of organisation operating within a satisfactory level of returns which will help to withstand the more severe instabilities of returns and which will aid in mitigating the severity of fluctuations of returns. In turn, desirable organisation relates to the character of organisation lying within the general scope of managerial capacity of existing farm operators, as demonstrated by the common adaptations of farm organisation for the conditions and the areas concerned. With this, desirable organisation implies a character of production which is not inconsistent with the generally accepted needs for the longer-time conservation of the soil resources.

Principal Features of Organisation

With respect to its relationship with the attainment of satisfactory farm returns, desirable farm organisation is concerned with a number of individual features of organisation. These features have a varying significance in terms of their relation to returns and their influence under different circumstances.

In addition to the general factor of productivity, related to the selection of the land area, there are five factors which have an important influence in determining the relative returns of farm businesses. These include, on the one hand, the factor of size or scale of business, related to returns through the varying efficiencies of operator and family labour, and the varying costs of production permitted by different scales of operation. Secondly, they include the factor of type of production or combination of enterprises, associated with returns through the differing scale as well as character of returns allowed by different kinds and combinations of enterprises. Thirdly, is the factor of comparative efficiency of use of production factors, influencing returns in terms of comparative costs of production. Fourthly, they include the factor of comparative effectiveness of production practices, concerned with the maintenance of effective physical production, which affects returns by determining the comparative positions of returns and costs. Lastly, is the important factor of effectiveness of production adjustments, embodying the processes of adjustment of the farm business to changes in prices, costs, and other factors which influence the general character of farm returns and their comparative level over longer periods of time.

While some of the above factors constitute primarily factors of management, each of them relates in some degree to features of farm organisation. Size or scale of business

relates to management in terms of the limitations which management may place upon the effectiveness of scale or the achievement of a desirable scale. To a much more important degree, however, it is a factor of organisation and can probably be classed as a dominant feature of organisation in relation to farm returns.

The second factor of combination of enterprises also relates to management through the varying ability of management to achieve and to sustain desirable enterprise combinations. However, it too remains primarily a factor of organisation, and, in terms of its important relation to both the level and character of returns becomes one of the more important features of organisation.

The factor of efficiency of use of production factors perhaps remains predominantly a factor of management by virtue of the importance of management decisions in determining the selection of production factors and their manner of use in individual operations. It also embodies elements of organisation in terms of the manner in which inflexible factors such as land and labour influence both the combination of factors and the efficiency with which they can be used under various circumstances.

In turn, the factor of effectiveness of production practices embodies principally a management factor related to the individual management decisions made with respect to individual farming operations. At the same time, however, it is associated with features of organisation concerned with limitations of organisation in terms of labour and equipment which may

limit the adoption of desirable practices.

The last factor pertaining to effectiveness of adjustments probably relates more closely to management than any of the other factors. It embodies the important production and financial decisions concerned with changing conditions of production and their associated risks and uncertainties. Such decisions, however, are made in relation to the scope of adjustments permitted within the prevailing organisation of the business. In this respect the factor also retains a broad association with features of organisation, particularly that of combination of enterprises affecting the needs and possibilities of adjustments, and that of scale of business, influencing the scope of adjustment and the comparative severity of risks and instabilities.

An appraisal of farm organisation, therefore, seems to focus on two major features of organisation, along with some secondary features of more individualistic, or generally less significant importance. The first major feature relates to scale of business, bearing a general relation to the scale of farm returns. The second concerns the feature of enterprise combination, having a relation to the scale of returns, and to the maintenance of satisfactory security and stability of returns. The secondary features concern mainly the character of factor combination for such elements as labour and equipment, affecting the efficiency of use and comparative costs of factors and the comparative effectiveness of production practices. The latter assume a highly individual character

and have greater or lesser significance under different circumstances. In addition to the above features, the appraisal of farm organisation is concerned with the general character of organisation as it relates to the managerial capacities and abilities of operators. With this it is concerned with the general character of organisation as it relates to the longer-time conservation of soil resources.

Factors Affecting the Relationship of
Various Features of Organisation

The particular conditions of farming and production which prevail for southwest Saskatchewan lend a generally different significance to the individual features of farm organisation than they assume under the conditions of other areas. With respect to the factor of size of business, the primary adaptation of the area to crop production, particularly wheat, determines an extraordinary significance of size of business as a basis of desirable organisation. On the one hand, the ready adaptability of such production to mechanisation lends a high flexibility to the labour capacity of the operator. It permits the extension of scale of operation through the use of larger and more efficient machines, without involving large additional requirements of labour or conflicts of farming operations which would reduce the effectiveness of production. Similarly, the relatively few and simplified farming operations required under the prevailing conditions of climate allows an assumption of increased scale with relatively limited increases in the

managerial burden of the operator so as to place a relatively wide range of scale within the scope of effective managerial capacity of individual operators. On this basis, increased scale allows increases in gross returns from production which are largely proportionate to the increase in scale throughout a wide range of scale and a wide range of managerial capacities.

On the other hand, the increased efficiency of labour and the reduced requirements of other factors permits important economies of production costs with larger scale. The limited building requirements associated with crop production result in a rapid reduction in the overhead costs of farm buildings, particularly the farm home, as scale increases. Similarly, the equipment investments required for larger scale represent a lower relative cost because of the lesser relative costs of larger machines and the increased efficiency of use of machines allowed. With this, the organisation for larger scale usually permits some economies in operating expenditures with respect to fuel, equipment and building repairs, and labour, resulting both from the lower relative requirement of factors and the direct economies allowed. As a result, increased scale of operation, in addition to allowing a ready maintenance of gross returns, usually permits a significant reduction in per-unit costs of production. Coupled with the increased efficiency of operator's labour this permits an increase in net returns for the operator which greatly exceeds the proportionate increase in scale. In this respect, size of

business assumes a generally greater significance in relation to desirable organisation under the conditions prevailing for southwest Saskatchewan than for other areas of production and can probably be considered to constitute a factor of primary significance for this area.

While associated more importantly with the scale of returns, size of business also bears relationships with the character of returns. Large scale of operation implies large outlays for current operation and the assumption of large obligations in attaining scale. It thereby becomes subject to relatively high risks and insecurities of returns under variable conditions of prices and production. More particularly it becomes subject to relatively large losses from farming operations under conditions of extremely low yields and prices.

The highly variable conditions affecting production returns in southwest Saskatchewan may perhaps suggest severe risks and insecurities of larger scale offsetting the benefits of a larger scale of returns. On the other hand, under the extreme variations which prevail, the ability to withstand the risks and instabilities of production depends to an important extent upon attaining a minimum income within difficult periods and achieving a reserve of income from more favourable periods. The lower production costs associated with larger scale permit the maintenance of minimum income

under less favourable conditions than would apply to smaller scale. At the same time the larger returns permitted by larger scale under favourable conditions not only offset the lower returns under unfavourable conditions, but also allow more successful accumulations of reserves against unfavourable periods than is permitted on the basis of small scale of operation. In these respects, scale of operation as a feature of organisation perhaps assumes additional significance for southwest Saskatchewan in behalf of its relation to the particular character of instability which prevails.

The feature of enterprise combination also assumes a peculiar relationship in terms of the conditions prevailing for the southwest. Because of the severe instabilities to which the area is subject, desirable enterprise combination becomes particularly significant as a possible means for achieving more desirable production for the area. Since, however, the cropland areas are adapted primarily to wheat, and alternatively to the common cereal crops, which show generally comparable effects of yield and price variations, effective diversification for greater stability depends largely on the inclusion of livestock enterprises. With respect to livestock enterprises however, the conditions of the area impose relatively strict limitations on the extent to which various types and sizes of enterprises are adapted. They also limit the extent to which such enterprises can contribute to greater stability and security of returns.

Hog enterprises have a very limited adaptation to the area owing to the low relative yields of coarse grains in comparison with the main cash crop of wheat. They are subject to the production instabilities affecting coarse grain production and to price instabilities which seriously limit their contribution to the stability of total farm returns. Cattle and sheep, therefore, remain the principal livestock enterprises having a general significance for the area.

For these enterprises, in turn, the low productivity of cropland in forage production generally allows too low a return to permit them to compete successfully with wheat production for the use of the cropland area. They retain a comparative advantage mainly for areas of poorer lands not suited to cropping which allow comparatively low production costs. Thus, beyond the limited sizes of enterprises which serve to provide for home consumption of products, their effective adaptation is largely confined to farms and areas where waste pasture land is available.

In addition to this limited scope of adaptation, these enterprises also have limitations in improving farm returns. They require considerable outlays for fencing and water development which involve a considerable risk, and a relatively high cost unless the enterprises can be undertaken on a relatively good scale. They are subject to the production instabilities associated with pasture deterioration

and feed crop failures. In addition they are subject to price instabilities which in the past have been little, if any, less severe than in the case of cereal crops. In this situation, they remain hazardous enterprises, giving only limited possibilities for improving the general stability of farming returns.

By virtue of the relatively particular adaptation of livestock enterprises to areas of available pasture land, farm organisation as it relates to livestock enterprises largely becomes an additive feature of cropland organisation. Limitations of markets confine cattle enterprises very largely to the production of beef animals. The livestock enterprises concerned are therefore of the extensive type, involving few conflicts with cropland farming and having relatively little influence on the general organisation of the business. Their labour requirements are limited and appear mainly in the winter season so as to supplement the use of labour in cropping. Their feed requirements are met mainly by grazing so that they have a limited effect on the cropping and equipment organisation of the farm. Similarly, they imply only limited provision of additional buildings. In these respects they constitute an addition to the ordinary organisation of the farm for crop farming and permit evaluation largely in terms of their additive effects on the returns from crop farming.

With respect to the more individual feature of labour and equipment organisation, the conditions of the southwest determine a fairly standard organisation in terms of labour,

with a relatively flexible organisation in relation to equipment. The flexible relation of equipment organisation, however, occurs mainly with respect to size, rather than type of machine. Through the adaptability of crop farming to mechanisation, total labour requirements are limited and the major portion of the farm labour is supplied directly by the operator. Some additional family labour is generally used, mainly during the cropping season, on farms on which it is available. Where family labour is not available, the operator's labour is supplemented by a limited amount of hired labour, sometimes confined entirely to the harvest season, and sometimes including the main cropping season. In this way farm organisation is characterised by a generally limited labour supply made up to a very large extent by operator and family labour. At the same time, because of the facility of mechanisation, this character of labour supply extends throughout a wide range of farm size and type.

Equipment organisation, in turn, reflects the primary adaptation to the area of tractor power, surface tillage, and combine harvesting, which determines a generally standard type of the main farm machines. Some variations occur with respect to individual tillage and seeding machines and with respect to additional machines related to livestock production. Also, there are variations with respect to relative ages of machines, reflecting different efficiencies of use and differing practice with regard to new or second-hand purchases. The main variations, however, occur in relation to the size of machine, re-

flecting the adaptation to varying scale of business. In these respects, equipment organisation can be interpreted largely in relation to standard organisations associated with scale of operation. Also, the requirements of machines determined by the conditions of the area assumes a relationship with the feature of scale of business through the different costs of equipment associated with varying sizes of business.

With regard to the general feature of farm organisation related to soil conservation requirements, the conditions of the southwest permit a generally difficult basis of appraisal. The cereal crop type of farming to which the cropland areas are primarily adapted is generally recognised as a soil depleting type of farming. Its depletive effects may occur, on the one hand, in the gradual form of slow depletion of nutrients and organic matter, and on the other hand, in the more serious form of soil removal through wind and water erosion. The former can be regarded as a gradual, persistent effect applicable to all soil areas; the latter represents a particular hazard having an immediate danger for certain less stable soil types and for areas subjected to inappropriate tillage and cropping practices.

In relation to the above, the general type of crop farming for the area can be suggested to be inconsistent with longer-time requirements of adequate soil conservation. However, alternative types of farming, within the apparently practical

limits of adaptation, offer little contribution to the attainment of satisfactory conservation practice. Limitations of markets and limitations of climate restrict severely the use of alternative cash crops of a soil restorative character. Livestock enterprises, except in so far as their use would imply the rotation of cropland under hay and pasture crops, result in only limited contributions to the restoration of fertility and the prevention of erosion. Since the adaptability of livestock enterprises in respect of desirable cropland use is severely limited they do not achieve particular significance in relation to the soil conservation problems of the area. Practical measures for immediate soil conservation needs are confined mainly to the use of desirable tillage practices to combat erosion, and the retention of seriously unstable soils under native grass cover. To a limited extent they may involve the use of poorer croplands under hay or pasture rotation, or the reseeding of abandoned areas to grass cover. The problem of soil conservation thereby assumes a general relationship with the problems of the area. However, it allows only general consideration in terms of its relation to the requirements of desirable farm organisation.

SCALE OF BUSINESS AS A FEATURE OF FARM ORGANISATION

The indication of factors affecting returns pointed to the significant influence of size or scale of business as a feature of farm organisation. The relatively direct relationship of size to returns suggests the possibility of determining general ranges of both minimum and optimum requirements of scale for different farming conditions in southwest Saskatchewan.

Determination of Farm Budgets Relative to Scale of Business

To indicate concretely the relationships of scale of business which might furnish guides to effective scale for various circumstances, complete farm budgets were drawn up, on the basis of particular assumptions, and designed to provide an estimate of the income associated with various scales of business under different conditions which could be considered typical for the conditions given. The estimate of income was based upon assumption as to various production and cost price relationships, using past averages as guides. The estimates therefore become hypothetical when applied to the future. However, in so far as they provide comparative indications of the effects of scale they can be considered to provide a guide to requirements of scale within reasonable ranges of estimate.

Two sizes of farms, representative of major groups of farms in the area, were chosen to indicate the relationships of scale. These included farms of one-half section in size, representing farms of relatively small scale, and farms of one and one-half

sections, representative of farms of moderately large scale.

The two sizes appeared representative of two relatively common groupings of farms for the area of study. Based on census figures, 34 percent of all occupied farms in the four census divisions of southwest Saskatchewan in 1936 were of half section size, and 30 percent were of the one section or over size. It was considered that budgets for these two sizes would permit interpolation of returns for intermediate sizes.

Land Use

Cropland areas in southwest Saskatchewan are limited by the quality of the soil, nature of topography, degree of stoniness and miscellaneous factors. Where these factors are favourable a large proportion of the farm area is suitable for cropping purposes. On the other hand, in areas of unfavourable topography and for areas of lighter sandy soils the proportion of cultivated land is generally low and large areas remain under grass cover. Table XI shows the census data for 1941 on the proportions of improved and unimproved land in farms for the 12 municipal units included in the 1945 Land Use survey. The proportion of improved land for the several municipalities varied widely, ranging from a low of 47.6 percent of the occupied area in R.M. of Rodgers and R.M. of Chaplin to a high in R.M. of Lawtonia of 81.2 percent. The average proportion fell in a general range of 60 to 70 percent. The unimproved area was represented almost wholly by uncultivated areas of native prairie, with a very small proportion of waste land in the form of alkali sloughs, coulee banks, etc.

Table XI Area and Condition of Occupied Farm Land for 12
Municipal Units of Southwestern Saskatchewan, 1941.

Municipal Unit		Total Occupied Farm Acreage	Prairie or Natural Improved Pasture Waste		
Name	Number		Percent		
Rodgers	133	162,738	47.6	51.8	0.5
Shamrock	134	164,234	70.2	29.1	0.7
Lawtonia	135	204,977	81.2	16.9	1.9
Coulee	136	204,303	69.7	28.5	1.8
Swift Current	137	264,940	73.3	26.4	0.3
Webb	138	258,463	64.8	34.1	1.1
Wheatlands	163	165,421	54.2	45.6	0.2
Chaplin	164	142,135	47.6	51.7	0.7
Morse	165	184,105	66.9	31.7	1.4
Excelsior	166	290,059	61.5	38.0	0.5
Saskatchewan					
Landing	167	188,784	66.1	30.8	3.1
Riverside	168	290,780	72.4	26.0	1.6

Data collected during the 1945 Land Use survey as shown in Table XII indicated variations from 27.4 to 82.1 percent improved land for the different groups of farms. For groups 1 and 2 in which land class 3 predominates the proportions of improved land were 80.8 and 82.1 percent respectively. For groups 3, 4, 5, and 6, in which land classes 1 and 2 are important, the proportions of improved land were considerably lower, ranging from 64.4 percent for group 5 to the low of 27.4 percent for group 4.

With respect to the budget estimates, the land area of the farms was assumed to be representative of land class 3. In so far as the farms representative of this land class in the study in many cases included considerable areas of grazing land of lower classes used for the support of livestock enterprises,

it was considered that the amount of improved land for crop-land farms would be somewhat higher. On this basis an average improved acreage of 85 percent of the occupied area was assumed in the budgets.

Table XII Proportion of Occupied Area Improved for Farms of Land Use Survey, 1945.

Group	Total Area Operated	Improved Area as Percentage of Tot- al Operated
1	12,660	80.8
2	16,520	82.1
3	23,370	48.2
4	18,945	27.4
5	27,260	64.4
6	29,777	49.7

The assumption as to the use of the improved land of farms was subject to a number of considerations. Crop rotations designed to maximize revenue over longer periods of time in southwest Saskatchewan are tempered on the one hand by the necessity of moisture conservation and wind erosion, and on the other hand by the respective yields of various crops obtainable under the conditions of climate which prevail. The increased use of tractor power also has had an effect on crop rotations, tending to further emphasize wheat production relative to coarse grains. Census data for 1926 to 1941 for the 12 municipal units surveyed in 1945, indicating the proportions of improved land devoted to summerfallow

and to various crops, are shown in Table XIII.

Table XIII Distribution of Improved Acreage by Crops, 12 Municipal Units of Southwest Saskatchewan 1926 to 1941

Year of Census	Improved Acreage	Fallow	Wheat	Oats	Barley	Other
Percent						
1926	1,390,706	30.0	50.2	9.6	2.8	7.4
1931	1,681,184	31.3	49.0	9.1	0.9	9.7
1936	1,628,335	30.2	51.1	8.6	1.5	8.6
1941	1,657,479	45.6	36.8	5.7	1.0	10.9
Average	1,589,426	34.3	46.8	8.3	1.6	9.0

The proportion of the cropland area summerfallowed varied from 30.0 percent in 1926 to 45.6 percent in 1941 with an average of 34.3 percent for the four census periods. The proportion of the area producing wheat for the four periods ranged from a high of 50.2 percent in 1926 to a low of 36.8 percent in 1941, with an average of 46.8 percent. Oat acreage showed a significant decline from 9.6 percent in 1926 to 5.7 percent in 1941, with an average of 8.3 percent. Barley acreage ranged from 2.8 percent in 1926 to 0.9 percent in 1931 with an average proportion of 1.6 percent. Along with the above, small proportions of the cropland acreage have been devoted to other crops, including grains such as flax and rye, and a small amount of forage crops.

The acreages devoted to various crops and summerfallow for the groups of farms included in the 1945 Land Use survey are shown in Table XIV.

Table XIV Crop Areas as Percentage of Improved Area by Groups, 1945

Group	Fallow	Wheat	Oats	Barley
1	37.9	46.7	5.2	4.0
2	36.7	51.0	3.5	4.9
3	42.1	38.2	9.1	4.8
4	39.9	28.2	9.2	6.3
5	39.3	39.5	5.6	3.3
6	35.3	44.1	6.2	5.0

The acreage of summerfallow ranged from 35.3 to 42.1 percent for the various groups of farms, with an average level for the cropland farms of about 37 percent. Wheat occupied from 28.2 to 51.0 percent of the acreage for respective groups, with about 50 percent as an average for the cropland groups. Oats and barley acreages were relatively small for all groups, being particularly small for the cropland farms.

The above data suggest the predominance of a three-year crop rotation as the most typical rotation followed in southwest Saskatchewan, with wheat being practically the sole cash crop, and with small coarse grain acreages related mainly to the requirements of existing livestock enterprises. In relation to the proportions of summer-fallow acreage shown by the census and Land Use study it was assumed for the budgets that the area of summerfallow would approximate 35 percent of the cultivated land for the two groups of farms. Oats and barley acreages were

allowed to meet the estimated feed requirements for the limited numbers of livestock assumed for the two types of farms. The remaining cropland area was then assumed to be devoted entirely to wheat. The distribution of the acreages for the budget farms on this basis was set as shown in Table XV.

Table XV Distribution of Acreage for Budget Farms

Land Use	Small Cropland	Large Cropland
	Acres	
Wheat	145	475
Barley	5	5
Oats	15	18
Forage	7	10
Summerfallow	<u>100</u>	<u>307</u>
Total improved	272	815
Pasture	44	133
Waste	<u>4</u>	<u>12</u>
Total operated	320	960

The number of livestock kept on farms in southwest Saskatchewan is generally limited. On cropland farms livestock and poultry are supplementary enterprises, and are typically of kinds and numbers sufficient to meet the farm family requirements with the surplus providing a small cash income. The average numbers of cattle and swine for farms in the four census divisions of southwest Saskatchewan were shown for 1941 in Table VI, page 12.

These included 8.9 cattle, 5 sheep and 4.1 pigs per farm.

Table XVI shows the average numbers of cattle and swine on the farms included in the 1945 Land Use survey.

Table XVI Average Number of Livestock per Farm for Land Use Survey, 1945

Group	No. of Farms Reporting	No. of Farms Re- porting Livestock	Cows	2 Year Olds	Year- lings	Calves	Sows	Other Pigs	Total Ani- mal Units (Ex. swine and horses)
1	33	29	3.7	1.9	2.2	2.8	1.0	6.5	7.4
2	23	17	3.8	2.1	3.7	3.8	1.4	6.9	9.0
3	35	35	11.0	4.5	6.5	8.7	1.9	8.1	21.3
4	15	15	16.9	7.7	9.3	12.7	2.9	11.4	32.6
5	30	30	8.9	3.6	6.1	7.3	1.5	8.3	17.9
6	21	21	17.0	6.7	10.8	12.7	1.9	9.6	33.1

Numbers of cattle and hogs kept on the two groups of cropland farms did not vary appreciably, the enterprise on the large farm being only slightly larger than on the small farms. Greater numbers were shown for farms in groups 3, 4, 5 and 6. Even for these farms however, the average number per farm remained moderate. In so far as farms in the Land Use survey indicated a general over-stocking of farms relative to pasture areas, and in so far as the average number was probably influenced by a few farms having larger numbers it was assumed that the typical cattle herd for the small cropland farm would include about 3 cows with increase. The large farms were assumed to include about 4 cows with their corresponding young stock. It was assumed that the cows would be milked to provide for home needs and would allow

small sales of surplus butterfat. The disposal of beef animals was considered to follow the usual practice of the area in the form of the sale of animals as two-year olds, with allowance for the replacement of cows and home needs.

In relation to other livestock it was assumed that each size of farm would include 2 general utility horses, a sow with litter, and a farm flock of 75 hens.

Inventories of animals and the disposal of animals and products assumed in the budgets are summarised in Table XVII.

Table XVII Animal Inventory and Animal Products Disposal for Budget Farms

	Average Inventory		Eaten on Farm		Sold	
	<u>Small</u>	<u>Large</u>	<u>Small</u>	<u>Large</u>	<u>Small</u>	<u>Large</u>
Horses	2	2				
Cows	3	4				
2 year olds	2-3	3-4	1	1	1	2
Yearlings	2-3	3-4				
Calves	2-3	3-4				
Total Cattle	9-10	12-13	1	1	1	2
Brood sows	1	1				
Other hogs	7	7	2	2	5	5
Total hogs	8	8	2	2	5	5
Poultry	75	75	15	15	30	30
Product sales				Small		Large
Cream (lbs. of butterfat)				150		310
Eggs (dozens)				280		280

Equipment

In addition to cropland and livestock organisation, budget estimates for farms require a concept of the probable amounts of equipment, buildings and labour associated with typical units. Existing inventories of equipment on farms indicate considerable variation. Most farms in the Land Use survey had unused or infrequently used and unsuitable types of machinery. In other cases equipment was inadequate for farm requirements.

The more important equipment items on farms for cropland and for cropland-livestock farms in the Land Use study are summarised in Table XVIII.

Table XVIII Kinds and Sizes of Machines for Various Groups of Farms of Land Use Survey, 1945.

Machine	33 Small Crop- land Farms		23 Large Crop- land Farms		21 Large Cropland Large Livestock Farms	
	No. of Farms Report- ing Machine	Typical Size Report- ed	No. of Farms Report- ing Machine	Typical Size Report- ed	No. of Farms Report- ing Machine	Typical Size Report- ed
Tractor	28	3 plow	23	4 plow	17	4 plow
Harvester Combine	14	6 foot	16	10 foot	13	10 foot
Swather	6	12 foot	8	16 foot	5	12 foot
Grain Separator	2		3		8	28 inch
Header Barge	4	12 foot	1	12 foot	1	12 foot
Grain Binder	26	8 foot	15	8-10 foot	20	8-10 foot
Motor Truck	14	$\frac{1}{2}$ ton	15	1 ton	9	1 ton
One-way Disc	17	6 foot	20	8 foot	16	8 foot
Seeder Attachment	16	6 foot	16	8 foot	13	8 foot
Tractor Plow	13	3 bottom	12	4 bottom	8	4 bottom
Disc Harrow	23	16 foot	20	21 foot	14	21 foot
Drag Harrow	31	18 foot	19	18 foot	21	18 foot
Duckfoot Cultivator	17	10 foot	11	10 foot	13	9 foot
Mower	23	$5\frac{1}{2}$ foot	14	$5\frac{1}{2}$ foot	18	$5\frac{1}{2}$ foot
Hay Rake	22	10 foot	14	10 foot	21	10 foot
Grain Drill	29	20 run	17	28 run	20	28 run
Wagon Gear	32	high	20	high	21	28 inch
Sleigh	22		15		19	
Tools and Equipment	33	misc.	22	misc.	21	misc.

There were no major differences in the types of machines employed on the respective groups of farms although there were some variations in the proportion of farms reporting various machines. The difference between groups occurred almost wholly in relation to the sizes of machines. Each group of farms showed considerable duplication of particular machines associated with seeding, cultivation and harvesting. Many farms showed both one-ways and plows; seed drills and one-way disc-seeders; and grain binders and separators, as well as combine-harvestors. This indicated a failure to dispose of older equipment which had been replaced by newer types of machines. To this extent, the assumption as to equipment items on farms was related to those types of machines having a current adaptation. All of the types of machines which were considered to be currently adapted and which prevailed on the majority of farms were assumed to be included in typical equipment inventories for the budget farms.

With particular reference to small farms the total investment assumed is consistent with the necessity of limiting it to major requirements, and is based on new values. It is probable that there are on many farms other items of equipment not shown in the budgets. It is, however, also true that many of the listed and unlisted items will be second-hand with a total investment approximating that used in the budgets.

The estimate for miscellaneous tools and equipment was made on a general basis, allowing for a revaluation

comparable to that indicated by existing inventories. The inventories of equipment for the budget with estimated inventory values based on approximate new values of machines is given in Table XIX.

Table XIX Equipment Inventory of Budget Farms

Typical Machine	Half-Section Farm		One and One-Half Section Farm	
	Size	Investment	Size	Investment
Tractor	3 plow	1250	4-5 plow	2055
One-way Disc	6 foot	280	9 foot	425
Seeder attachment	6 foot	85	9 foot	115
Seed drill			28 run	380
Disc harrow	16 foot	200	21 foot	280
Cultivator			12 foot	225
Harvester combine	5½ foot	835	12 foot	1675
Mower	5 foot	130	5 foot	130
Rake	10 foot	65	10 foot	65
Wagon and box	high	130	high	130
Motor truck			1 ton	1250
Harness	2 sets	40	2 sets	40
Tools and Miscellaneous*		150		450
Total		\$3165		\$7220

* Miscellaneous includes cream separator, poultry equipment, grain loader, grain cleaner, feed and grain chopper and gasoline engine.

The total estimated investment of \$3165 for the small farm represented a per acre investment of \$11.64, and the total investment of \$7220 for the large farm represented a per acre investment of \$8.86.

Buildings

Building investments bear a peculiar relationship in farm business organisation. The investments bear only a limited re-

lation to specific requirements of buildings. The dwelling house constitutes the greatest individual building investment on most farms, and such investment depends mainly on the operator's decision as to the size of investment which he desires and may be able to afford. To this extent there are large differences in investment between individual farms and between areas having different productivity to support building investments. The investments in barns and other buildings relate more particularly to the actual requirements for buildings. With respect to barns however, a large number have become obsolete with the substitution of tractor power and frequently are being used to only a fraction of their capacity. Reasonable investments relative to present needs would be limited to the size required to stable the cattle, pigs and general utility horses, and would represent considerably smaller investments than are actually found in many cases. In the same way, present day methods of harvesting and hauling have probably reduced requirements for storage below the capacity of granaries available on most farms.

In relation to these characteristics of building investments Table XX summarises information on buildings for the farms of the 1945 Land Use survey.

Table XX Numbers and Investments of Buildings Reported for Various Groups of Farms, Land Use Survey, 1945.

Type of Building	Number of Buildings Reported	Number of Farms Reporting New Value of Buildings	Average Investment	Range of Investment	
				Low	High
<u>33 Small Cropland Farms</u>					
House	33	31	\$1500	\$400	\$4000
Barns	28	28	\$ 782	\$200	\$1700
Granaries	91	31	\$ 343	\$100	\$ 750
Machine shed	5	5	\$ 440	\$200	\$1000
Garage	22	22	\$ 135	\$ 40	\$ 300
Hog house	9	9	\$ 66	\$ 50	\$ 150
Poultry House	20	20	\$ 104	\$ 30	\$ 300
All Other Buildings	11	10	\$ 94	\$ 35	\$ 200
Total			\$3464		
<u>23 Large Cropland Farms</u>					
House	20	20	\$1730	\$300	\$5000
Barns	20	20	\$1065	\$150	\$3500
Granaries	100	22	\$ 592	\$200	\$1900
Machine shed	4	4	\$ 225	\$100	\$ 500
Garage	19	19	\$ 172	\$ 10	\$ 750
Hog house	9	9	\$ 94	\$ 25	\$ 250
Poultry House	17	16	\$ 253	\$ 50	\$ 788
All Other Buildings	15	8	\$ 95	\$ 20	\$ 135
Total			\$4226		
<u>21 Large Cropland - Large Livestock</u>					
House	18	18	\$1789	\$300	\$4200
Barns	20	20	\$1325	\$200	\$3800
Granaries	101	19	\$1041	\$200	\$5000
Machine shed	7	6	\$ 847	\$ 80	\$1500
Garage	15	15	\$ 173	\$ 50	\$ 400
Hog House	5	5	\$ 124	\$ 50	\$ 200
Poultry house	18	18	\$ 162	\$ 50	\$ 356
All Other buildings	4	3	\$ 100	\$ 25	\$ 200
Total			\$5561		

Based on new values, the average dwelling house investment for the three groups showed a narrow range of from \$1500 for small cropland farms to \$1789 for large cropland - large livestock farms. At the same time there was a wide range of investment for individual farms of from \$300 to \$5000.

The average investment in barns amounted to \$782 per farm for the small cropland farms, and \$1325 for the large cropland - large livestock farms. The range for individual farms extended from \$150 to \$3800. Investment for other buildings with the exception of granaries showed only a limited relation to size and kind of farm. In the case of granaries, the average investment was \$343 for small cropland farms, \$592 for large cropland farms, and \$1041 for large cropland - large livestock farms.

The average investment for all buildings based on new values was \$3464 for small cropland farms, \$4226 for large cropland farms, and \$5561 for large cropland - large livestock farms.

To determine probable typical building investments for the budget farms, an inspection was made of investments for each type of building for each farm in respective groups. Investments which were very small or large in comparison with the common range of investment were eliminated. The estimate of typical building investments was then made in terms of the average values for the remaining farms. In the case of the investments in farm dwellings a limited adjustment was made, allowing a somewhat larger investment for the larger

farm in accordance with its greater capacity. Some adjustment was also made for barns and granaries to reflect the somewhat different requirements for existing types of farming. Moreover, while machine sheds were not common, it was considered that these facilities would become of increasing importance in the future, and allowance was made for a reasonable building investment for this purpose on the large farm. The buildings investments imputed to the budget farms are summarized in Table XXI.

Table XXI Assumed Values of Farm Building Investment for
Budget Farms

	<u>Small Cropland</u>	<u>Large Cropland</u>
House	1500	3000
Barn	450	840
Granaries	150	285
Machine Shed	(200	700
Garage		200
Poultry house	100	150
Total Investment	\$2400	\$5175

The total investment in all buildings of \$2400 for small farms represented an investment per acre of cropland of \$8.80. For the larger farm the total value of \$5175 was equivalent to \$6.35 per acre of cropland.

Labour

The adaptation of cereal crop farming to extensive mechanisation through the use of tractors, trucks, grain loaders, seeder tillers and combine-harvesters, limits farm labour requirements to comparatively small amounts. The mechanized

farm enterprise requires little employment of outside labour excepting during certain busy seasons, notably seeding and harvesting, when some extra help is usually employed by most farms. The characteristics of labour requirements of farms in southwest Saskatchewan as determined by the Land Use survey are illustrated by Table XXII.

Table XXII Labour on Farms, Land Use Survey, 1945.

Group	No. of Farms	Average Area of Cropland	Average No. of Animal Units*	Labour Supply (Months of Labour)			
				Operator	Family	Hired	Total
1	33	310	17.5	12	0.5	0.9	13.4
2	23	590	9.8	12	1.9	1.6	15.5
3	35	322	30.5	12	3.9	0.8	16.7
4	15	346	49.4	12	3.1	1.1	16.2
5	30	585	26.6	12	5.5	1.8	19.3
6	21	662	45.9	12	11.4	2.0	25.4

Despite the major differences in cropland areas and live-stock numbers between groups of farms, the amounts of labour used showed only limited increases with increased labour requirements. For all groups of farms, the operator's labour constituted about half or considerably more of the total labour supply. Family labour was the next most important type of labour, with hired labour constituting a comparatively small proportion in all cases.

The fact of the limited increase in labour with larger farms and livestock enterprises is accounted for very largely by the fixed quantity of operator's labour, which allows a

* Including all animals.

large expansion of the farm enterprise without the addition of further labour supplies. Particularly in the case of the cropland farms, increases in the size of farm were accompanied by only a very small increase in total farm labour. Consistent with these characteristics it was assumed that the amount of hired labour would be small, and only a little greater proportionally in the case of the larger than the smaller farm. The small farm was allowed 1.5 months of hired labour and the large farm 3.5 months, in addition to the operator. It was considered that these amounts would meet the additional seasonal requirements of labour associated with the two types of farms.

Crop Yields

In relation to the estimate of returns from production, crop yields for the budget farms were determined in terms of yields which reflect a usual yield condition for a major portion of the area. Crop yields in the area vary considerably with types of soil and with the varying climatic conditions encountered in various areas. The predominant soils of the area, however, are of medium loam texture. Yield information from various sources is indicative of the probable cropland yields associated with this type of soil.

Based on an extensive soil-texture grouping, the 16 year average wheat yield for three soil groups representing light, medium and heavy textured soils within the loam grade for 56 municipal units in southwest Saskatchewan for the years 1921-1936 are shown in Table XXIII.¹²

12. Spence and Hope, Op. cit., pp. 16-17.

Table XXIII Average Wheat Yields by Soil Groups.

<u>Soil Group</u>	<u>Number of Records</u>	<u>Yield</u>
Loam and silty clay loams	1307	12.1
Loams and silt loams	920	11.4
Sandy loams to light loams	270	10.5

These yield data indicate a relatively narrow range of yields between the various soil groups. For the common loam and silt loam of the area a yield level of around 11.4 bushels seems to constitute a representative yield for the area.

Parkinson developed estimates of long-time yields for soil types, based on interpolations from municipal yield data.¹³ The estimates for several of the more important soil types in the area of southwest Saskatchewan are summarised in Table XXIV.

Table XXIV Average Wheat Yield for Soil Types.

<u>Soil Type</u>	<u>Yield</u>
Haverhill clay loam	13.1
Haverhill clay loam and Sceptre clay	13.1
Fox Valley loam and silty clay loam	12.5
Haverhill loam	11.4
Fox Valley loam	10.3
Haverhill light loam	10.7
Hatton fine sandy loam	8.5

13. Parkinson, W., Probable Average Wheat Yields in the Province of Saskatchewan Based Principally on Soil Type. M.Sc. thesis, University of Saskatchewan, 1941, pp. 100-106.

Based on these yields, central yields for the area fall within the range between 12.5 bushels for the Fox Valley loam and silty clay loam and 10.3 bushels for Fox Valley loam. The yield for Haverhill loam, which represents a common and widely distributed soil type for the area, is estimated at 11.4 bushels.

A further study of average wheat yields for soil groups classified in accordance with comparative index ratings determined by the Saskatchewan Soil Survey¹⁴ was made by Lane.¹⁵ The yields calculated on this basis for the 1921-36 period for intermediate-textured soils for southwest Saskatchewan are shown in Table XXV.

Table XXV Average Wheat Yields for Soil Groups with a Comparative Index Rating.

Index Rating	Soil Groups included	Yield
56 - 61	Clay loams and silty clay loams	13.2
44 - 49	Loams and silt loams	11.7
38 - 43	Sandy loams and light loams	10.3

In accordance with the above estimate an average yield for loam soils is indicated at 11.7 bushels. On the basis of the various estimates, a typical yield of wheat for the budget farms was assumed at 11.5 bushels. Yields for oats and barley were based on the common ratios of oats and barley

14. Saskatchewan Soil Survey, op. cit., p. 196.

15. Lane, S.H., Analysis of the Wheat Yield History in Thirty-Nine Municipal Units in Southwest and West-Central Saskatchewan, Unpublished.

yields to wheat yields prevailing for the area. Yields of grains and forage used in the budgets are shown in Table XXVI.

Table XXVI Assumed Grain and Forage Crop Yields Used in Budgets

Type of Crop	Ratio to Wheat	Assumed Yield per Acre
Wheat		11.5
Barley	1.35	15.5
Oats	1.78	20.5
Forage		1 ton

Prices

The prices used represent the most uncertain element of a budget determination of probable returns. Unlike the conditions of physical production, prices are subject to much more variable and uncertain estimate. The prices assumed for a budget determination should be related, on the one hand, to a reasonable estimate of future expectations, and on the other hand, to the cost level used for net income calculations.

The costs used in the budget calculation were formulated in relation to the information of the 1945 Land Use survey. This survey, applying to the crop year 1944, probably indicates lower costs for various factors than might be imputed on the basis of a longer-time cost-price relationship owing to the limited cost increases arising out of the wartime period up to that time. This suggested an estimate of product prices on a conservative basis in comparison with longer-time past levels. At the same time it was considered that factors

affecting wheat markets and production might contribute to a less favourable wheat price for the future than has been obtained for the longer-time past. On this basis prices for the budget were related to a price period reflecting some of the incidence of low prices associated with the depression period. On this basis farm prices for grain products were assumed at the averages of the 1926-45 period. For live-stock, average prices of the period 1928-45 were used. These prices are shown in Table XXVII. Farm prices were determined from final market prices less respective deductions for freight and handling from Swift Current.

Table XXVII Farm Prices for Grains and Animal Products Used in Budgets.

<u>Product</u>	<u>Grade</u>	<u>Price</u>
Wheat	No. 2 Northern (bus.)	\$.80
Barley	No. 3 C.W. (bus.)	.40 $\frac{3}{4}$
Oats	No. 2 C.W. (bus.)	.34 $\frac{1}{2}$
Steers (2 yr. olds)	Good (cwt.)	6.10
	(1050 cwt. and under)	
Hogs	B-1, (cwt.)	8.85
Hens	Aged (each)	.60
Eggs	A medium (doz.)	.15
Butterfat	No. 1 (lb.)	.26 $\frac{1}{4}$

General Farm Expenses

The operating and over-head costs associated with the farm business are an important item in net income determination. The over-head costs include the depreciation allowances for buildings and equipment and an allowance for the cost of the capital investment of the business, and bear an important association with the scale of business.

For mechanised farms more important items of operating cost include fuel, oil and grease requirements for equipment operation, upkeep costs on real estate such as taxes, insurance, building and other real estate repairs, repairs to equipment, hired labour, and in some cases hiring of custom operations. Less important items include a large number of miscellaneous expenses such as hardware, costs of seed treatment, breeding fees, veterinary and medicines etc.

For the purpose of the budgets, probable operating costs were imputed by an inspection of operating costs of individual farms within the several groups and by a determination of probable typical costs associated with individual cost items. Each item of cost was assessed individually for each farm. The numbers of farms having such costs and the amount of such costs were observed and the typical cost for each item was interpolated in relation to the averages shown for the common groups of farms. A comparison of the actual and budget estimates of operating costs for the two types of farms is summarised in Table XXVIII.

Table XXVIII Operating Expenses For Small and Large Cropland Farms by Farm Size

No. of farms Acres of cropland Item	Small			Large				
	Survey		Budget	Survey		Budget		
	33			23				
	310		272	589		815		
	Average per farm	Number with item	Average for farms with item	Average per farm	Number with item	Average for farms with item		
Tractor costs	266	27	319	265	465	23	465	543
Combine costs	70	10	212	45	82	12	157	205
Truck costs	89	13	220		188	15	295	175
Taxes	62	29	93	72	136	21	149	216
Hired labour (with board)	94	18	172	110	138	10	317	271
Building repairs	52	23	74	25	65	14	197	53
Paint and painting	14	17	27	11	18	9	47	21
Fire insurance	6	17	12	6	8	13	14	11
Fence upkeep	19	25	26	9	13	14	21	18
Well upkeep	3	6	16	2	1	5	6	3
Binder twine	16	28	19	4	13	16	18	5
Hired threshing	64	15	142	20	35	6	135	23
Hired hauling	44	23	63	7	142	15	218	
Other custom work	12	7	56		10	4	59	12
Seed treatment	3	25	4	3	3	19	3	5
Other equipment repairs	42	27	51	23	84	21	92	57
Blacksmithing	12	27	14	10	23	18	29	18
Small hardware	13	32	14	8	28	22	29	15
Other gas, oil and grease	3	15	6	5	8	16	11	13
Breeding fees	2	13	5	4	11	9	6	5
Veterinary and medicines	3	15	7	4	6	10	14	5
Sprays and germicides	2	17	5	3	4	12	7	3
Telephone	6	17	12	12	10	14	13	12
Auto costs $\frac{1}{2}$ share: (including depreciation, gasoline, oil and grease)				50				100
Total	897			698	1491			1789
Per Acre	2.89			2.57	2.53			2.20

Variations of budget estimates from actual averages were allowed in relation to various circumstances. Tractor costs were adjusted in relation to fuel costs for average crop conditions and in relation to a normal estimate of repair costs. Combine costs were adjusted to take care of the specific type of combine assumed for each farm, and for the influence of custom operation. Charges for twine and threshing in the budgets were based on the assumption that coarse grain crops would normally be harvested by this method. Other items of cost were in each case adjusted to what was considered a normal relation of cost in contrast with variations from normal cost frequently associated with actual expenditures. Allowance was also made in the budgets for the operation and upkeep of a car. The expense for the small farm allowed for a limited car investment and a limited operating mileage in comparison with those for the larger farm. In each case one-half of the total estimated car cost was charged to the farm with the remainder being considered a portion of the operator's personal expense.

Equipment and Building Depreciation

Overhead costs for equipment and buildings include an allowance for normal depreciation, representing the requirements of cost associated with the replacement of the respective capital items within their lifetimes of use on the farm. These allowances are influenced by two main factors. On the one hand they are affected by the differing lifetimes of the capital items, on different farms associated with differing efficiencies of use. In addition, they seem to be influenced by the income position

of farms whereby farms with lower incomes try to achieve lower costs through protracting the lifetime of machines and buildings. This difference is exemplified by the situation wherein some farms with favourable income use predominantly new machines which are often replaced before their useful life is completed. Other farms, with low incomes, in contrast, rely on lower cost second hand machines or carry machines on the farms for a greater period of time. This feature, as related both to equipment and building investments seems to result in some "squeeze" of the cost of these items on farms of limited economic capacity.

In relation to the above condition the budget estimate of equipment depreciation took account both of the longer lifetime of machines on the smaller farm due to commonly lower efficiencies of use, and of the fact that smaller farms would be subject to a greater need for reducing costs. Table XXIX summarises estimated lifetimes of common machines on small and moderate-sized farms for the prairie area as determined by a machinery survey.¹⁶

Table XXIX Estimated Life of Common Farm Machinery by Farm Size¹⁶

Item	Estimated Average Useful Life (years)	
	One-half section	One section and over
Tractor	16.9	15.2
Combine	10.6	11.8
Truck	15.0	13.9
Car	15.0	15.0
Power binder	16.0	15.4
One-way disc	13.2	11.5
Grain seeder	23.0	19.0
Cultivator	23.0	19.7
Disc harrow	22.9	18.4
Mower	28.3	24.6
Rake	26.0	26.0
Wagon	28.2	23.2
Trailer	16.0	16.0
Stationary engine	19.0	19.0

16. Neilson, J.D., and Andral, M.E., Farm Machinery Requirements in Saskatchewan, 1945, unpublished data.

The figures indicate a moderately shorter lifetime of machines on the larger farms. Due to the factors affecting the availability of equipment it is probable that the differences are less significant than they would have been under ordinary circumstances.

Applying estimates of lifetime for each machine with some adjustments from the above table to the inventory of machines for the budget farms, the composite rate of depreciation for the moderately large farm seemed to approximate a rate within the range of $6\frac{1}{2}$ to 7 percent. For the small farm, the rate approximated a range of 6 to $6\frac{1}{2}$ percent depending upon the alternative bases of estimate. Recognising the element of cost reduction as indicated above, which would apply to the small farm, it was assumed that the probable rate of depreciation would approximate 6 percent for the small farm and 7 percent for the large farm.

Building depreciation was based on an arbitrary estimate of the probable life of various types of buildings on farms. Information on buildings is seriously inadequate both in relation to indicating expected lifetimes, and the variations in lifetime associated with differing conditions of construction and use. Relative to existing information on farm buildings shown by farm surveys¹⁷, it was assumed that farm dwellings would have an effective lifetime of about 40 years, equivalent to a depreciation rate of $2\frac{1}{2}$ percent. Barns were assumed to have a lifetime in the range of 30 to 35 years, with a depreciation

17. Stutt, R.A. Some Observations on Farm Houses in Representative Areas of Saskatchewan, Economic Annalist, Economics Division, Dominion Department of Agriculture, Ottawa. November 1943, P. 69.

rate of about 3 percent. For other buildings it was recognised that lifetimes would vary widely but would perhaps run within the range of 15 to 25 years, with an average depreciation rate of about 4 percent. In terms of the distribution of the building investment between different types of buildings, the above represents a composite rate of about 3 percent of the total investment for most types of farms, and this rate was applied uniformly in the budget estimates.

Capital Costs

When the net return of the farm is to be indicated as a residual return to the operator for his labour and management, the further item of cost concerned in the net income calculation is that of the cost of capital. This represents the allowance for the use of capital in the form of buildings, equipment and land, together with the additional working capital of the farm.

The allowance to be made for capital investment may be evaluated in terms of alternative viewpoints. The commonly accepted method is to allow a return to capital equivalent to the alternative cost of borrowed capital. For the different condition of capital borrowing associated with farms at the present time, this would have suggested rates at levels of perhaps 5 or 6 percent.

In relation to determining the probable labour return remaining to an operator from a farm, the above method of imputing capital costs may not be wholly realistic. On the one hand

considerable of the capital made available to the farm business is not obtained by borrowing, but consists of initial starting capital together with capital accumulated through savings made by the operator out of the returns of the farm. The alternative cost of such capital would presumably be the rate which could be earned in alternative investments, which under present circumstances might be limited to some 3 or $3\frac{1}{2}$ percent. In this respect the cost of capital under actual conditions of operation could be considered to be lower than that suggested by a borrowing rate.

From a further alternative viewpoint, it might be considered that the cost of capital assessed against the farm earnings would not be comparable to a borrowing rate assuming capital to be borrowed for an indefinite period. Rather, it would comprise the net cost of capital assuming the investment of the farm to be amortized within the normal period of occupancy of the farm operator. On the basis of a borrowing rate of 6 percent, the rate required to amortize a particular investment over a period of 25 years amounts to 7.82 percent and for a 35 year period, 6.90 percent.¹⁸ These rates would cover the borrowing charge of 6 percent in addition to amortizing the principal sum in the respective periods. To the extent that the principal payments constitute a return to the operator in the form of an increased equity, equivalent to 4 percent for the former period and about 3 percent for the latter, the net cost of capital to the operator would remain in the neighbourhood of only about 4 percent.

18. Mathematical annuity tables.

In respect of the above, capital costs for the budgets were allowed at 5 per cent in the case of buildings and equipment, and 4 per cent in the case of land. The 5 per cent was applied to half of the estimated new values of equipment and was presumed to allow for the additional requirements of working capital above those items which could not be readily evaluated. The 4 per cent for the land investment was applied to an estimated normal valuation of the land investment gauged by the values determined in the Saskatchewan assessment system.¹⁹

Income Summary

A summary of the final budgets for the two sizes of farm to include receipts and operating expenses is provided in Tables XXX and XXXI. Total receipts for the small farm amounted to \$1492, comprising \$1108 from the sale of crops, \$250 from the sale of livestock and products, and an estimated \$135 from custom work. For the large farm cash receipts amounted to \$4528, representing \$3815 from crops, \$353 from livestock and \$360 from custom operations. Cash operating expenses amounted to \$698 and \$1789 respectively, for the two sizes of farms.

19. Freeman, T.H. and Chappel, C.H., Manual for Saskatchewan Assessment Valuers, unpublished.

Table XXX Budget for Small-Sized Farm (272 acres cropland)
for Average Level of Productivity (11.5 bushels
wheat yield).

Utilisation of Land						Sales		
	Acres	Yield per Acre	Total Yield	Farm Used		Amount	Price	Value
				Seed	Feed			
Wheat	145	11.5	1667	182	100	1385	0.80	1108
Barley	5	15.5	67	7	60			
Oats	15	20.5	307	40	267			
Forage	7	1 ton	7 tons		7 tons			
Summerfallow	100							
Total cropland	272							1108
Pasture	44							
Waste	4							
Total operated	320							

Livestock and Livestock Products						Farm Operating Expenses - Cash	
	Average	Eaten on Farm	Sales				
	Inventory		No.	Price	Value		
Horses	2					Tractor costs	\$265
Cows	3					Combine costs	45
2 year olds	2-3	1	1	\$6.10	\$ 61	Truck costs	—
Yearlings	2-3					Taxes	72
Calves	2-3					Hired labour (with board)	110
Brood sows	1					Building repairs	25
Other hogs	7	2	5	8.85	89	Paint and painting	11
Poultry	75	15	30	0.60	18	Fire Insurance	6
Total livestock sales					\$168	Fence upkeep	9
Sale of Dairy products	150 lbs. b.f.			26.4¢	\$40	Well upkeep	2
Sale of eggs	250 doz.			15¢	\$42	Hired threshing	20
Total sale of products					\$82	Binder twine	4
						Hired hauling	7
						Other custom work	—
						Seed treatment	3
						Other equipment repairs	23
						Blacksmithing	10
						Small hardware	8
						Other gas, oil and grease	5
						Breeding fees	4
						Vet and medicines	4
						Spray and germicides	3
						Telephone	12
						Auto costs ½ share	50
						(included as depreciation and grease, gasoline, oil)	
							\$698

Farm Receipts	
Crop sales	\$1108
Livestock sales	168
Livestock product sales	82
Custom work	135
Total	\$1493

Table XXXI Budget for Large-Sized Farm (815 acres cropland) for Average Level of Productivity (11.5 wheat yield).

Utilisation of Land						Sales		
	Acres	Yield		Farm Used		Amount	Price	Value
		per Acre	Total Yield	Seed	Feed			
Wheat	475	11.5	5463	594	100	4769	0.80	\$3815
Barley	5	15.5	67	7	60			
Oats	18	20.5	369	50	319			
Forage	10	1 ton	10 tons		10 tons			
Summerfallow	307							
Total cropland	815							3815
Pasture	133							
Waste	12							
Total operated	960							

Livestock and Livestock Products						Farm Operating Expenses - Cash	
	Average Inventory	Eaten on Farm	Sales				
			No.	Price	Value		
Horses	2					Tractor costs	\$543
Cows	4					Combine costs	205
2 year olds	3-4	1	2	\$6.10	\$122	Truck costs	175
Yearlings	3-4					Taxes	216
Calves	3-4					Hired labor (with board)	271
Brood sows	1					Building repairs	53
Other hogs	7	2	5	8.85	89	Paint and painting	21
Poultry	75	15	30	0.60	18	Fire Insurance	11
Total livestock sales					\$229	Fence upkeep	18
Sale of Dairy products	310 lbs.	b.f.	@	26.4	\$82	Well upkeep	3
Sale of eggs	250 doz.	@	15¢		\$42	Binder twine	5
Total sale of products					\$124	Hired threshing	23
						Hired hauling	—
						Other custom work	12
						Seed treatment	5
						Other equipment repairs	57
						Blacksmithing	18
						Small hardware	15
						Other gas, oil & grease	13
						Breeding fees	5
						Vet and medicines	5
						Spray and germicides	3
						Telephone	12
						Auto-costs ½ share	100
						(includes depreciation)	
						(gasoline, oil & grease)	
						Total	\$1789

Farm Receipts	
Crop sales	\$3815
Livestock sales	229
Livestock product sales	124
Custom work	360
Total	\$4528

Reductions of overhead cost items and the calculations of the net incomes to labour available from the respective farms are summarised in Table XXXII.

Table XXXII Income Summary for Small and Large-Sized Budget Farms.

	<u>Small Farm</u>		<u>Large Farm</u>	
	<u>Total</u>	<u>Per acre Cropland</u>	<u>Total</u>	<u>Per acre Cropland</u>
Total cash receipts	1493	5.49	4528	5.56
Cash operating expenses	698	2.57	1789	2.20
Net Operating Income	<u>795</u>	2.92	<u>2739</u>	3.36
Depreciation -				
Equipment	190	0.70	505	0.62
Buildings	72	0.26	155	0.19
Net Farm Income	<u>533</u>	1.96	<u>2079</u>	2.55
Capital Costs -				
Equipment & Buildings	139	0.51	310	0.38
Land	134	0.49	403	0.49
Net Returns to Labour	<u>260</u>	0.96	<u>1366</u>	1.68

Depreciation costs accounted for \$262 for the small farm and \$660 for the large farm, so as to result in comparative farm incomes for the respective farms of \$533 and \$2079. The further subtraction of capital costs, comprising \$273 for the small farm and \$713 for the large farm, resulted in an estimated net return to the operator for labour and management of \$260 and \$1366 respectively. These net labour returns were equivalent to \$0.96 and \$1.68 per acre, respectively.

The difference in the comparative net returns of the two farms was associated with several factors. To a limited extent it reflected the slightly higher gross returns to the larger

farm arising out of the somewhat larger volume of custom work assumed in terms of typical conditions. More importantly, however, it was associated with the lower costs of the larger farm, both in respect to operating and to overhead items of depreciation and capital costs. Operating costs for the larger farm amount to \$2.20 per acre compared with \$2.57 for the small farm. Depreciation costs constituted a cost of \$0.81 per acre for the large farm and \$0.96 per acre for the small farm. Capital costs in turn amounted to \$0.87 and \$1.00 per acre respectively. The lower costs for the larger farm arose despite the somewhat higher investments in capital factors assumed to be associated with these farms on the basis of typical conditions. The large farm was indicated to have a considerably larger total investment in buildings and a higher rate of cost in respect to equipment. Despite this factor, the greater efficiency provided by the larger farm, more than offset the effect of the higher investments.

In the above respect, the difference in net returns between the two sizes of farms is not completely comparable. Allowing an investment for the small farm comparable to that for the large farm would result in a lesser relative net income for the small farm than indicated. Similarly, were the large farm assumed to maintain a minimum investment comparable to that of the small farm its net return would be considerably greater than shown. These characteristics of differing investment and cost relationships between farms of different economic capacity point up a significant phase of the problem of evaluating comparative incomes of farms and of establishing a concept of the minimum requirements of effective farm organi-

sation for different circumstances.

Net Income Relative to Productivity

The important effect of business size on net income within comparable gross incomes, would suggest an even more important influence based on varying productivities of areas, in so far as differences in productivity would seem to relate to large differences in the gross returns of businesses. Long-time yields of wheat for southwest Saskatchewan vary from a low of 8 bushels or less for some soils to as high as 16 to 17 bushels for superior soil types. These differences in yield suggest a ratio of 2 to 1 in the gross per acre incomes allowed to various farms.

A complete analysis of the net incomes related to various levels of productivity would involve income comparisons for samples of farms for a considerable range of size types. Such data for setting up comparative budgets for soil types were not available in the present study. In lieu, an attempt was made to obtain estimates of comparative incomes on the basis of general interpolations and estimates allowed by collateral data from various farm management surveys and business studies.²⁰ Taking the budget determinations as related to a wheat yield level of 11.5 bushels, estimates were made on the one hand of the comparative positions of costs and returns for a lower yield level of 8.5 bushels, representa-

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20. 1. Changes in Farm Income and Indebtedness in Saskatchewan During the Period 1929 to 1940, Farm Management Department, University of Saskatchewan, Saskatoon.
2. Probable Net Farm Revenues for the Principal Soil Types of Saskatchewan.
3. Spence and Hope op. cit. appendix A p. 39.
4. Freeman and Chappel op. cit.
5. Elliott, G.C., Land Utilisation and Adjustments in the Organisation of Farms Southwest Central Saskatchewan.

tive of inferior soils of the area. On the other hand, estimates were made in relation to a yield level of 16.5 bushels, representing superior soils. The estimates were guided by the comparative variations in investment and cost conditions of farms indicated by the general information as above. In addition, they were formulated in terms of consistent comparisons with the budget standards.

A summary of the adjustments made in relation to the different levels of productivity for the two sizes of farms is presented in Tables XXXIII and XXXIV.

The adjustments are indicated in terms of reductions and increases in particular items, each reflecting the probable change of conditions which seemed to be allowable on the basis of available information. These changes involved both direct variations of costs with output and efficiency as well as the indirect changes associated with different conditions of income promoting different levels of costs and investments.

On the basis of the assumed changes in returns and costs, net balance returns per acre showed a greater than proportionate increase with productivity. At the same time the relative increase with higher productivity was greater for the larger sizes of farms, indicating an increasing divergence of net per acre returns with larger size and higher productivities. For the small farm net labour returns amounted to \$1.41 per acre for the 16.5 bushel yield level, in comparison with \$0.63 per acre for the 8.5 bushel level. For the large farm the respective per acre returns amounted to \$2.85 and \$1.03.

Table XXXIII Adjustment for Productivity - Small Farm

Cost Item	Yield Decreased to 8.5 bus. Character of Adjustment	Per acre Adjustment	Yield Increased to 16.5 bus. Character of Adjustment	Per acre Adjustment
Operating Costs:				
Fuel	5% reduction	0.03	10% increase	0.06
Taxes	land value reduced to \$7 per acre	0.14	land value increased to \$26 per acre	0.28
Hired labour	.5 month reduction	0.13	.75 month increase	0.18
Building upkeep	33.3% reduction	0.04	50% increase	0.07
Other expenses	10% reduction	0.04	15% increase	0.07
Auto allowance	\$20 reduction	<u>0.07</u>	\$30 increase	<u>0.11</u>
All operating		0.45		0.77
Depreciation:				
Equipment	.5% reduction in rate	0.06	1% increase in rate	0.12
Buildings	33.3% inventory reduction	<u>0.09</u>	50% inventory increase	<u>0.13</u>
All depreciation		0.15		0.25
Capital:				
Equipment and Buildings	33.3% building inventory reduction	0.07	50% building inventory increase	0.11
Land	\$5 per acre reduction in value	<u>0.28</u>	land value increased \$14 per acre	<u>0.56</u>
All capital		0.35		0.67
All costs		<u>0.95</u>		<u>1.69</u>

Table XXXIV Adjustment for Productivity - Large Farm

Cost Item	Yield Decreased to 8.5 bus. Per acre		Yield Increased to 16.5 bus. Per acre	
	Character of Adjustment	Adjustment	Character of Adjustment	Adjustment
Operating Costs:				
Fuel	5% reduction	0.03	10% increase	0.07
Taxes	land value reduced to \$7 per acre	0.14	land value increased to \$26 per acre	0.28
Hired Labour	1 month reduction	0.10	1 month increase	0.10
Building upkeep	25% reduction	0.02	40% increase	0.04
Other expenses	10% reduction	0.02	15% increase	0.04
Auto allowance	\$20 reduction	<u>0.02</u>	\$30 increase	<u>0.04</u>
All operating		0.33		0.57
Depreciation:				
Equipment	.75% reduction in rate	0.09	1.25% increase in rate	0.11
Buildings	25% inventory reduction	<u>0.07</u>	40% inventory increase	<u>0.08</u>
All depreciation		0.16		0.19
Capital:				
Equipment and Buildings	25% building inventory reduction	0.05	40% building inventory increase	0.06
Land	\$5 per acre reduction in value	<u>0.20</u>	land value increased \$14 per acre	<u>0.35</u>
All capital		0.25		0.41
All costs		<u>0.74</u>		<u>1.17</u>

Table XXXV Comparative Receipts and Returns of Small and Large-Sized Farms for Various Levels of Productivity.

Small	8.5	11.5	16.5
Gross Receipts per acre	4.21	5.49	7.63
Operating costs	2.12	2.57	3.34
Depreciation:			
Equipment	0.64	0.70	0.82
Buildings	0.17	0.26	0.39
Capital	0.65	1.00	1.67
Net Returns	0.63	0.96	1.41
<hr/>			
Large			
Gross Receipts per acre	4.16	5.56	7.89
Operating costs	1.87	2.20	2.77
Depreciation:			
Equipment	0.53	0.62	0.73
Buildings	0.12	0.19	0.27
Capital	0.61	0.87	1.27
Net Returns	1.03	1.69	2.85

The increase in net returns with productivity would be readily expected on the basis of the considerably larger gross returns allowed. The more limited increase in net returns than gross returns was accounted for to a moderate extent by the direct increase in costs. To a very important extent, however, it was accounted for by the relatively severe "squeeze" on various cost items for the farms of lower productivity, in the form of reduced building investments, extended lifetimes of equipment, and reductions in dispensable cost items. The same factor accounted for the lesser difference in net returns between small and large-sized farms for poorly productive, in comparison with highly productive areas.

Net Income Relative to Price

For the purpose of the budgets, the prices of products were

intentionally selected to represent a conservative estimate of probable prices. To the extent that the price estimates are low relative to the costs assigned, the resulting net incomes would be generally lower than could be expected to prevail. Also, while the differences between various sizes of farms would not be affected, a low price estimate would result in an under-estimate of the increase in net income with higher levels of productivity.

The effect of an alternative price estimate can be readily indicated by reference to the comparative gross per-acre returns for the various conditions. Thus an assumed product price, representing an increase of 5 percent above the initial level, would constitute an approximate change of 5 percent in gross per-acre returns, which would be reflected directly in the net per-acre labour return. Thus a 5 percent increase in price would constitute an additional net labour return for both sizes of farms of about 21 cents for the 8.5 bushel yield condition, 27 cents for the 11.5 bushel yield and about 38 cents for the 16.5 bushel yield. This would represent a significant increase in net labour returns, and indicates the vulnerability of an income estimate to price assumption. At the same time the income increase would effect a somewhat greater disparity in net per-acre income between areas of low and high productivity.

Net Incomes of Farms for Varying Sizes and Productivity

The formulation of the relationships of net income for a range of size and productivity seems to allow a reasonable indication of probable net incomes for additional circumstances on the basis of interpolations within the range. Such interpolation is

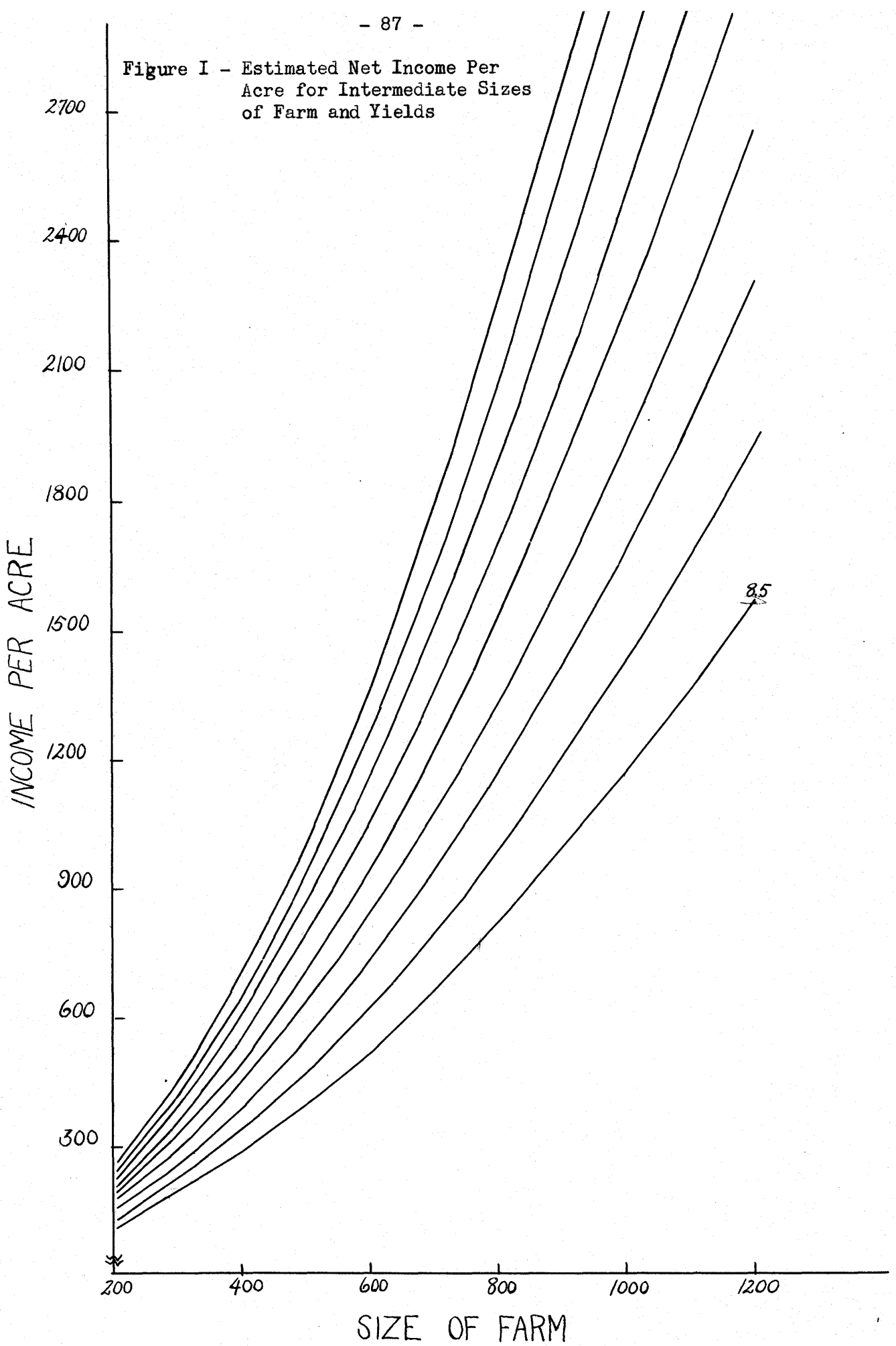
provided in Figure 1 and Table XXXVI. Figure 1 establishes the estimated per-acre net incomes for intermediate sizes of farm and yields, while Table XXXVI summarizes the aggregate net incomes for each condition.

Table XXXVI Aggregate Net Income for Various Sizes of Farms and Levels of Productivity.

Productivity Rating	200	300	400	500	600	700	800	900	1000	1100	1200
8.5	114	195	292	400	522	665	816	990	1170	1364	1572
9.5	134	231	344	480	630	805	1000	1206	1430	1672	1944
10.5	156	264	400	560	738	945	1176	1413	1690	1980	2304
11.5	172	300	452	635	840	1078	1336	1620	1940	2277	2640
12.5	190	333	504	715	948	1225	1520	1863	2230	2618	3060
13.5	204	360	556	785	1050	1358	1704	2070	2490	2937	3420
14.5	218	390	604	865	1158	1505	1888	2313	2780	3300	3840
15.5	232	420	656	940	1272	1645	2080	2556	3080	3641	4260
16.5	246	447	700	1010	1368	1785	2248	2772	3350	3971	4656

The expectations of net income should provide the most useful guide to an indication of the size of farm providing an effective organisation for particular circumstances. In relation to such purpose the data of Table XXXVI do not provide an absolute indication. On the one hand, the estimated incomes are subject to the particular estimate of gross income associated with the given price assumption. Differences in price would result in moderate to relatively large changes in the income estimate for different portions of the Table.

Figure I - Estimated Net Income Per
Acre for Intermediate Sizes
of Farm and Yields



This is indicated by Table XXXVII which shows the comparative effect of alternative price estimates on the net income estimate. In so far as the amount of change in net income remains moderate for sizes of farms up to the moderate size groups, the income estimates shown by Table XXXVI would not be seriously distorted by a moderate variation price estimate.

Table XXXVII Approximate Changes in Aggregate Net Incomes for 5 and 10 Percent Changes in Price.

Productivity Rating	Change per Acre	Size of Farm					
		200	400	600	800	1000	1200
<u>5 percent change</u>							
		\$	\$	\$	\$	\$	\$
8.5	0.21	42	84	126	168	210	252
10.5	0.25	50	100	150	200	250	300
12.5	0.30	60	120	180	240	300	360
14.5	0.34	68	136	204	272	340	408
16.5	0.38	76	152	288	304	380	456
<u>10 percent change</u>							
8.5	0.42	84	168	252	336	420	504
10.5	0.50	100	200	300	400	500	600
12.5	0.58	116	232	348	364	580	696
14.5	0.66	132	264	396	528	660	792
16.5	0.76	148	296	444	592	740	888

Indication of an effective size of farm for particular conditions is also subject to the fact that the income estimate takes no account of the probable variations of income around the average estimate. In so far as such factor does not allow specific determination it suggests the need of viewing the income estimates in terms of somewhat more liberal standards of income requirements.

While the above suggest important limitations to determining an effective condition of farm size for particular circumstances

they nevertheless allow the use of the data of Table XXXVI as a reasonable guide to formulating an estimate of the size of farm which would meet a general level of net income defined within a moderate range. At the same time the comparative net incomes for various conditions should allow a reasonable estimate of size requirements on the basis of a comparison with a particular standard of size. Thus, if for example, it is accepted that a half section farm on superior soils provides a reasonably effective farm organization, the sizes of farms required to give a comparative income on other soil types offer a reasonable guide to comparative requirements for alternative conditions.

The concept of reasonably desirable farm size for different conditions permits difficult interpretation. Such concept is probably best defined in terms of two main limits of size. On the one hand it would consider the minimum condition of size below which the income capacity of the unit could be considered generally undesirable. On the other hand it would consider a condition of optimum or adequate farm size above which the income capacity of farms would be generally favourable.

For the purpose of defining the lower limits as above, reference can be made to income conditions which can be associated with inadequate standards of welfare. For the farm business the income most directly related to the welfare of the family is that given by the income made available to the family in the form of cash expenditures on living. Summaries of cash living expenditures of farms show a relatively wide range for the different conditions. In so far as they are related directly to the net income of farms they are considerably lower for poorly productive than for highly produc-

tive farms, for small farms than for large farms, and for years of low income than for years of high income. For larger groups of farms included in farm business studies average expenditures have ranged from below \$400 up to about \$1400 with an average level within the range of \$650 to \$700.²¹ The low standard of about \$400 of cash expenditure comparable to "relief" levels of the 1930's is obviously too low to indicate an income for minimum requirements. The average level of expenditure at close to \$700 would presumably exceed a minimum requirement. To the extent however, that farm incomes have been recognised as being generally low they probably suggest a position closer the minimum than to an optimum condition. On this basis an income of perhaps \$550 to \$600 might be suggested as a reasonable standard for a minimum requirement.

The concept of the standard of optimum income suggests even more difficult definition. Such a standard however, might be related to the condition of income for farming which would bear reasonable comparison with the incomes which might be earned by farmers in alternative occupations. Recognizing that farming represents to a major extent an unskilled occupation, although implying a somewhat greater requirement of initiative and managerial capacity than would be applicable to other occupations the major alternative of farm occupations would be in the predominant unskilled and semi-skilled industrial occupations. On this basis a concept of net

21. 1. Britnell, op. cit. ppl50-201.

2. Farm Management Department, University of Saskatchewan, Saskatoon, Sask., unpublished data.

3. Edwards, F.M., Farm Family Living in the Prairie Provinces, Dominion Dept. of Agriculture, Marketing Service, Economics Division, Publication No. 787, March, 1947.

income in farming comparable to the wage income earned in the above occupations might constitute a reasonable standard of optimum income.

The average annual wages of employees in manufacturing industries in Canada amounted to \$1024 in 1928, a low of \$785 in 1933 and \$1525 in 1943.²² In relation to an average, and considering the upward trends of wage rates, a reasonable comparative level of wages in industrial occupations might approach \$1300 to \$1400. For urban families within this income level expenditures on shelter approximate 19 percent of the total income.²³ Expenditures on foods approximate 31 percent of the total income of which about a half is for food in the groups of meats, eggs, dairy products and vegetables which for the farmer are made available from the farm. On this basis, and recognising some of the discrepancy between standards of urban and farm housing, a comparative income for the farm roughly equivalent to that assumed for an industrial wage earner would approximate \$900 annually. The standards of \$600 and \$900 of net labour returns were therefore assumed as standards of minimum and optimum income for determining requirements of farm size.

By the use of auxiliary graphs the sizes of farms required to provide levels of income at the above standards were determined, on the one hand, for the initial price assumption, and on the other hand, for the alternative price assumption allowing a 10 percent increase in price. The size requirements for the above conditions are summarised in Table XXXVIII.

22. Canada Year Books for years 1932 to 1946.

23. Family Income and Expenditures in Canada 1937-1938, Dominion Bureau of Statistics, King's Printer, Ottawa, p. 72.

Table XXXVIII Approximate Sizes of Farms Required for Minimum and Optimum Income for Various Levels of Productivity and for Alternative Price Assumptions.

Productivity Rating	Initial Price Assumption		10 Percent Increase in Price	
	\$600 Income	\$900 Income	\$600 Income	\$900 Income
	Acres			
8.5	650	850	490	670
9.5	580	750	440	600
10.5	542	680	400	540
11.5	482	625	370	500
12.5	445	580	340	460
13.5	420	540	320	435
14.5	400	510	295	410
15.5	375	485	285	390
16.5	360	465	270	370

Relative to obtaining a minimum level of income, the Table indicates a requirement of about one-half section size for relatively productive land increasing up to about section size for the poorly productive land. For the optimum income the land requirement of about three-quarter section size for the superior soil, and about five-quarter section size for the poorer soil were indicated. Differences in the requirement of size relative to different price assumptions are moderate. For the superior soil the 10 percent increase in price suggested a requirement of some 100 acres less area than for the central price assumption. For the inferior soil the increased price suggested an area of about 160 acres less than for the initial price assumption. The range of size for the two standards of income were also revealed to be relatively small. For both price assumptions the higher income standard was allowed by an increase in size range from about 100 acres for the superior soil to about 200 acres for the poor soil.

The above conditions suggested the possibility of defining requirements of adequate size of unit in terms of a range which would reflect the range in variation of the several estimates. For this purpose the size requirements for the initial and increased price assumptions in Table XXXVIII were arranged for each of the income levels. The range between the average size requirements for the \$600 and \$900 income standards were then taken as the size requirements which would provide a reasonable standard of income. These ranges of size for the various productivities, rounded to intervals of 10, are given in Table XXXIX.

Table XXXIX Average Size Requirements to Provide Assured Income Standards for Various Yield Levels.

Yield Level per acre	Income Size	
	\$600 acres	\$900 acres
8.5	570	760
9.5	510	680
10.5	470	610
11.5	430	560
12.5	390	520
13.5	370	490
14.5	350	460
15.5	330	440
16.5	320 ✓	420 ✓

In terms of the above indication, the requirements of size for a reasonable standard of income on superior soils was indicated at approximately a one-half to three-quarter section area. For intermediate types of soil common to the area, a size of about three-quarter section up to nearly one section was suggested. For the

relatively poor areas, on the other hand, a size requirement of one section to one and one-quarter section would seem to be applicable. They would be considered sizes of farms which, on the one hand, would be likely to provide standards of income of reasonably comparable amounts for the different types of areas. On the other hand, they would be considered as the sizes of farms which would give an income constituting a compromise between a minimum standard and a standard which could be considered comparatively desirable. In this respect they may define the sizes of units which would furnish a minimum objective in a program of effecting reasonably desirable size-of-farm adjustments.

ENTERPRISE COMBINATION AS A FEATURE OF FARM ORGANISATION

It was indicated that alternative enterprise combinations offered relatively limited opportunities in southwest Saskatchewan, owing to the predominant adaptation of cropland areas to grain production and particularly to wheat. The major alternative enterprise to grain was indicated to be that of cattle. The adaptation of this enterprise in turn was shown to be dependent primarily on the availability of grazing land in the form of native prairie unsuited to crop production.

In the above relationship the effect of enterprise combinations on the returns of the business became mainly an additive relationship. The limited requirements of labour associated with cattle enterprises, and the fact that most of such labour is complementary to labour used in crop production, permits the addition of a considerable range of size of cattle enterprise to cropland farms without material change in the organisation and returns of the

cropland portion of the farm business. In this respect the effect of enterprise combination in the form of an addition of particular cattle enterprises can be indicated by the relation of the net enterprise returns of cattle to the returns shown for cropland farms.

Studies of returns from cattle enterprises suggest an extreme variation of returns in relation to conditions of production and the assumptions which may be made with respect to various elements of costs.²⁴ Gross returns vary widely in relation to different intensities and efficiency of production. On the other hand, costs show an extreme variation in accordance with the types of factors, scale of enterprises, and the estimate of the cost condition for various factors.

A summary of returns of enterprises expressed in relation to some of the more important variations is provided in Table XL.

Table XL Estimates of Net Labour Returns from Typical Cattle Enterprises of Various Sizes and for Various Cost Assumptions.

	<u>Small</u>	<u>Medium</u>	<u>Large</u>
No. of cows	4	15	24
No. of animal units	9	38	61
Acres of pasture	185	765	1220
	<u>Net Labour Returns</u>		
Full costs	\$100.57	\$151.37	\$241.85
Reduced feed and investment costs	158.08	363.51	571.15
Minimum costs	184.03	441.12	688.55
	<u>Net Labour Returns per Acre</u>		
Full costs	\$0.54	\$0.20	\$0.20
Reduced feed and investment costs	0.83	0.47	0.47
Minimum costs	0.99	0.58	0.56

24. Andal, M.E., A Study of the Relationship of Livestock Enterprises in Farming in Southwest Saskatchewan. M.Sc. thesis, University of Saskatchewan, Saskatoon, 1947.

This indicates the calculated net returns to labour from typical cattle enterprises for three sizes of enterprise, and for three different assumptions as to costs. The initial cost assumption allows a calculation of all costs at alternative cost rates, including the alternative cost for feed, and an alternative cost for all capital invested at a rate of 6 percent. The second cost assumption provides for reduced costs of feed and investment whereby the costs of forage is reduced to a minimum direct cost of harvesting, whereas the investment rate is reduced from 6 to 3 percent. The third cost estimate indicated as a minimum estimate, allows for the further reduction in cost items to exclude half of the initial estimate of building costs and such factors as the use of horses and equipment which might be considered to constitute a general part of the farm overhead.

In relation to the above estimates, the net returns of cattle enterprises to labour appear to be of a moderate scale. Measured in terms of the net labour return per acre of land used for grazing, the labour returns of cattle enterprises seem to run considerably below the returns which can be attributed to cropland of even the poorest grade. This supports the contention that cattle enterprises do not furnish a ready alternative to wheat production in the form of allowing effective use of cropland for grazing and forage production for livestock. In the case of the smallest size of enterprise the comparatively high net labour return is associated directly with greater intensity of production in terms of the production of dairy products for home use and sale. On the basis of beef production as exemplified more nearly by the intermediate and large-sized enterprises the per-acre returns are low in comparison with those

of cropland even for the minimum cost assumption.

Relative to their aggregate contribution to labour returns the table indicates a net return from the small enterprise ranging from about \$100 to \$184 for the alternative levels of costs. This enterprise, consisting of 4 cows, producing calves together with dairy products for home use and sale, was only slightly larger than the size of enterprise assumed in the cropland farms. For the medium-sized enterprise, representing 15 cows, net labour returns ranged from \$150 to \$441 for the different cost estimates. The large scale size, representative of 24 cows, in turn, showed net labour returns of \$242 to \$689, respectively. Subtracting the returns of the small enterprise from those of the other enterprises, suggests approximate increments of net labour returns per cow for beef-cattle enterprises of about \$5 to \$7 per cow for the initial cost estimate and about \$19 to \$20 per cow for the intermediate cost estimate.

Using the intermediate estimate of cost which might apply in the case of the cattle enterprise combined in cropland farms the above figures would suggest net additions of labour returns from beef-cattle enterprises amounting to about \$240 for the intermediate scale of enterprise shown above and about \$420 for the large enterprise. These net additions of labour return added to the expected incomes from cropping shown by Table XXXVI would give an approximation of the income expectation for various combinations of cropland and cattle units. The \$240 net addition for an intermediate-sized cattle enterprise would represent the difference between the incomes of 400 and 600 acre farms for the poorest soil area and between

300 and 400 acre farms for the best soil area. In turn, the net additional return of \$420 for the large-sized cattle enterprise would represent the difference between a 400 and 700 acre farm for the poorest soil and between a 300 and about 450 acre farm for the best soil type. On this basis the addition of an intermediate-sized cattle enterprise would reduce the size requirements of farms to maintain a reasonable standard of income by from 200 acres for poorer soil areas to 100 acres for relatively good soils. The addition of the large-sized cattle enterprise, on the other hand, would represent a reduction in requirements of cropland by from 300 acres for poor soils to about 150 acres for good soils.

C O N C L U S I O N S

The purpose of the above analysis was to review some of the more significant features of farm organisation in their relation to the successfulness of farming in southwest Saskatchewan, and with the purpose of indicating possible standards of desirable organisation which might guide processes of farm unit readjustment for the area. Of the various features of farm organisation, those of apparently major significance, included the size of business and the combination of enterprises in the form of adapted livestock enterprises, principally beef cattle. The first indicated an important relation for the predominant type of farming for wheat production. The relation of the second was relatively adverse, including, on the one hand, a relation to the maximisation of income from the use of non-arable grazing land, and secondly a possible relation to the maintenance of a more desirable stability of farm income.

A further feature rested in the possible contribution to longer-time maintenance of soil fertility.

Size of business appeared to exert an extremely important influence in determining the comparative success of cropland farms. The changes associated with the size of business suggested both a direct and a greater than proportionate increase in available net income as the size of business increased within moderate limits. Variations in productivity accentuated the difference in income shown by different sizes of farms, with progressively greater net incomes for increases in size as the productivity of soil became more favourable.

The differences in income associated with the size of business were the result, on the one hand, of direct changes in efficiency in the use of factors accompanying size. On the other hand, they also reflected importantly the differences between the relative income position of farms determined both by size and productivity. These differences were manifested in progressively lower costs for particular dispensable cost items as the size and productivity of farms decreased. The principal factors affected by such cost reductions were the investment in the farm dwelling, investments in farm machinery, the grade of equipment employed, and various miscellaneous farm expenditures seemingly permitting some "squeeze" in costs under low income conditions.

In relation to the latter feature of costs, net incomes as shown by smaller-sized farms and poorer grades of land, were seemingly maintained above the level which would have prevailed assuming comparable levels of cost to those applying to larger and more productive farms. This suggested a comparatively significant feature

of net farm income in the form of an important flexibility of such net income relative to changing income conditions. In relation to the indication of effective size of units for the particular conditions, it determined a somewhat narrower range of size than would have been determined on the basis of strictly comparative standards.

Based upon a concept of a required net income ranging between a minimum and a comparative optimum standard, the incomes shown for various conditions of size suggested a requirement of between 320 to 480 acres of cropland for the superior soil areas of the region, 480 to 640 acres for average soils, and 640 to 800 acres for relatively poor soils. These sizes were represented as probable standards of size constituting reasonable minimum objectives of a desirable size-of-farm adjustments.

The above standards are indicative of a major deficiency in existing farm organisation in terms of inadequate sizes of farm units. The census estimates for 1941 indicated about 48 percent of all farms for the four census divisions of southwest Saskatchewan as being of about one-quarter and one-half section size, about 17 percent of three-quarter section size, and about 33 percent of one section or over in size. While census estimates of farm numbers are subject to some over-estimate, particularly for the smaller size groups, and while the distribution of farm sizes according to productivity is not known, the above figures suggested a large proportion of farms to be inadequate in size relative to a reasonable minimum standard. To this extent a part of the problem of low farm income associated with the southwest of the Province is traceable directly to a problem of ineffective adjustment of

farm units to the condition of the area. In so far as the existing area of settlement also suggests an extension of settlement beyond the limits of adaptation of cropland farming, the figures also suggest a major problem of excessive population for the apparent population supporting capacity of the region.

In relation to successful returns, alternative enterprise combination suggested a largely additive effect. Effective alternative types of production seemed to be confined more particularly to cattle enterprises using waste land pasture for grazing. Such enterprises appeared to allow moderate additions to the net income of cropland farms so as to suggest numerous alternative combinations of cropland and livestock units which might meet a particular income requirement. In view of the comparatively low per-acre return of cattle enterprises, the required size of enterprise to effect a reasonable addition to net return seemed to be relatively large and considerably beyond the size of enterprise commonly prevailing. At the same time the limited returns of cattle enterprises suggested the need for a relatively large scale of such enterprise before it could effect a significant stabilisation of the highly variable returns associated with crop farming. To this extent the possibility of effecting a significant degree of farm income stabilisation for the southwest of the Province through alternative enterprise combination suggests a requirement of major re-organisation of farms, perhaps well beyond the possibilities which the area affords.

The analysis of net incomes associated with various features of farm organisation suggested various limitations to the indication of concrete and comparable standards of organisation. The changing characteristics of farm units for different conditions of

size and productivity suggested a need for additional data on farms within a complete range of these factors. Such data would permit a more complete analysis of the change in net incomes associated with the changes in individual income conditions. Moreover, they might permit a comparison of net incomes determined on a completely comparative basis for all conditions so as to allow a more complete determination of standards of organisation which would be applicable to a specific concept of net income requirements.

The formulation of standards of organisation on a fully comparative basis would presumably allow a more complete indication of the problem characteristics of southwest Saskatchewan than can be given at the present time. Such standards would permit an indication of the degree of deficiency in existing organisation and would point to specific requirements of adjustments in organisation under individual circumstances. At the same time the degree of deficiency indicated by the existing organisation would suggest the limits of population-supporting capacity afforded by the resource base of the area. In so doing it might focus attention on the extent of the surplus population problem of the area and the need for effecting a reasonable population adjustment before other measures of rehabilitation can be made effective.

APPENDIX

Table 1 Average Monthly Cash Price Per Bushel of No. 2 Northern
Wheat at Winnipeg, Basis in Store Fort William-Port Arthur,
1926-1945.*

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Avge.
1945	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0				122.0
1944	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0	122.0
1943	87.0	87.0	93.5	95.4	96.0	97.5	105.2	106.6	111.7	119.6	122.0	122.0	103.63
1942	73.75	74.75	74.37	75.7	76.2	76.7	77.75	85.75	86.62	86.6	87.0	87.0	80.22
1941	71.75	72.75	74.25	73.62	73.62	74.62	72.12	70.75	70.0	70.75	70.12	71.25	72.13
1940	80.87	78.87	85.0	87.37	77.25	69.37	68.37	69.50	69.25	69.0	70.12	71.0	74.66
1939	57.0	57.37	56.5	57.5	62.25	57.87	51.75	51.37	71.12	68.0	68.0	80.37	61.59
1938	139.12	136.75	132.25	129.37	112.0	111.62	95.5	74.62	60.12	57.62	56.0	57.62	96.83
1937	123.0	125.0	134.12	136.5	127.87	122.0	142.75	125.75	129.0	135.75	129.62	132.62	129.50
1936	82.5	79.75	79.62	78.25	74.5	77.0	92.0	100.25	102.25	109.5	107.25	117.75	91.72
1935	75.62	76.5	78.87	84.62	82.75	78.75	78.37	81.5	87.25	88.12	83.62	81.62	81.46
1934	62.0	62.62	63.5	62.5	67.5	73.75	78.87	82.37	79.0	74.37	75.37	75.62	71.46
1933	42.0	43.87	47.75	51.87	62.0	65.25	81.0	71.37	65.12	57.75	60.87	57.25	58.84
1932	55.75	59.12	59.12	58.87	59.37	52.0		53.5	49.5	46.37	45.25	39.87	52.61
1931	51.12	57.0	54.37	57.25	57.87	57.75	54.25		49.5	54.5	61.62	56.12	55.58
1930	127.25	114.37	103.25	107.0	105.75	100.5	92.87	90.62	75.87	69.75	62.0	52.62	91.82
1929	116.75	124.5	123.62	119.62	110.25	115.25	156.87	154.5	146.5	138.37	130.25	135.0	130.96
1928	136.75	136.87	142.87	151.75	150.37	137.5	128.12	115.87	112.0	117.0	115.87	113.5	121.54
1927	130.87	135.12	137.62	141.25	152.37	156.87	158.37	154.87	141.12	136.87	138.25	135.37	143.25
1926	151.0	149.25	142.62	150.75	149.37	149.0	154.25	146.37	138.5	139.62	136.12	129.12	144.66
Avge.													95.323

* Quarterly Bulletin of Agricultural Statistics, Dominion Bureau of Statistics, Ottawa, Canada.

Winnipeg average cash price, 1926-1945 — 95.32 cents

Prairie Farm Assistance 1 percent 0.95

Handling charges 1.75

Freight 13.20

Total charges 15.90

Swift Current average farm price 79.42

Table 11 Average monthly cash price per bushel of No. 1 Swift Current
at Winnipeg, Basis in Store Fort William-Port Arthur,
1926-1945.*

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Avge.
1945	64.75	64.75	64.75	64.75	64.75	64.75	64.75	64.75	64.75				64.75
1944	64.75	64.75	64.75	64.75	64.75	64.75	64.75	64.75	64.75	64.75	64.75	64.75	64.75
1943	61.00	62.37	62.50	62.75	62.50	63.87	64.75	64.75	64.75	64.75	64.75	64.75	63.62
1942	61.12	62.25	62.12	62.62	64.00	64.75	62.87	59.00	58.87	59.25	58.00	58.00	61.07
1941	42.87	45.37	50.87	51.25	48.37	46.00	53.12	49.00	54.25	54.75	55.25	57.87	50.74
1940	50.00	52.12	51.25	50.87	40.12	32.62	33.12	32.37	34.87	39.87	44.75	41.62	41.96
1939	36.25	36.25	35.50	37.25	39.75	36.12	32.87	33.75	35.37	42.62	42.12	48.12	38.00
1938	61.75	63.87	59.12	55.50	56.25	53.25	46.62	38.00	34.25	35.87	34.37	35.75	47.88
1937	83.75	83.25	81.37	74.75	71.12	66.00	71.87	58.25	59.25	62.00	58.62	57.25	68.96
1936	35.25	36.12	37.75	37.87	37.25	38.00	51.00	59.87	58.87	61.00	61.87	76.37	49.26
1935	50.37	46.87	44.75	45.87	42.25	39.12	35.50	33.87	35.75	33.87	33.25	33.87	39.61
1934	38.75	40.00	39.75	36.87	38.00	43.62	45.87	56.62	58.50	51.62	52.00	54.87	46.37
1933	27.62	27.50	28.87	31.37	36.12	37.87	50.25	44.37	37.12	32.75	34.37	34.25	35.20
1932	37.75	38.37	39.87	41.00	40.25	37.75		34.50	28.87	25.75	30.25	27.75	34.74
1931	22.12	22.12	25.12	28.25	31.00	32.18	32.25		30.62	33.12	42.50	38.37	30.69
1930	56.75	50.75	46.62	48.87	44.87	39.37	39.12	39.00	31.62	28.25	23.37	25.00	39.46
1929	72.87	77.75	74.75	71.62	67.25	69.75	83.37	79.00	74.75	69.75	64.87	62.12	72.32
1928	83.25	86.25	91.25	93.12	91.62	89.25	83.00	67.87	66.25	70.12	68.37	66.37	79.73
1927	67.37	69.62	71.25	79.37	87.50	92.00	89.50	84.37	79.00	78.12	81.25	83.25	80.22
1926	61.25	59.00	58.50	63.62	61.37	61.87	62.87	61.75	63.00	64.62	63.87	63.62	62.11

* Quarterly Bulletin of Agricultural Statistics, Dominion Bureau of Statistics, Ottawa, Canada.

Winnipeg average cash price, 1926-1945

-- 53.57 cents

Prairie Farm Assistance 1 percent -	.536
Handling charges	1.75
Freight	10.56
Total charges	

12.84

Swift Current average farm price

-

40.75 cents per bus.

at Winnipeg, Basis in Store Fort William-Port Arthur,
1926-1945.*

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Avg.
1945	51.4	51.4	51.4	51.4	51.2	51.3	51.4	51.4	51.4				51.87
1944	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.4	51.2	51.4	51.4	51.4	51.4
1943	49.5	51.2	51.0	51.2	51.4	51.2	51.4	51.4	51.4	51.4	51.4	51.4	51.16
1942	50.75	50.00	50.00	51.25	51.50	51.50	51.25	46.12	48.37	48.00	45.37	45.37	49.12
1941	51.50	33.62	35.37	37.12	37.25	39.25	40.25	45.25	49.25	47.37	44.37	47.00	40.63
1940	42.62	41.75	38.75	38.50	35.12	31.37	32.12	29.00	30.37	33.00	35.12	33.25	35.08
1939	30.00	28.87	28.50	28.50	30.50	30.00	26.12	27.25	36.75	32.75	32.25	38.75	30.85
1938	56.50	56.75	52.12	50.25	49.00	45.50	41.25	31.25	29.50	28.12	28.25	28.50	41.41
1937	54.50	55.00	56.37	58.75	56.25	57.12	63.62	50.83	52.0	53.37	47.50	49.50	54.57
1936	33.62	35.50	35.87	33.62	33.0	33.37	41.37	49.50	44.87	44.62	45.62	50.00	40.08
1935	44.25	42.75	41.12	42.25	40.87	39.75	42.87	36.37	36.00	34.00	31.87	29.75	38.49
1934	33.50	33.75	33.62	32.37	34.62	37.75	38.75	43.62	45.75	41.50	44.12	44.25	38.63
1933	22.50	23.37	24.50	24.62	28.25	29.00	39.62	38.87	34.25	29.37	30.00	29.75	29.51
1932	29.37	29.50	30.00	32.37	35.50	33.87		29.87	26.12	23.50	24.00	21.00	28.81
1931	26.12	27.62	27.75	28.12	29.12	29.62	29.37		27.37	31.00	33.62	30.00	29.01
1930	59.50	59.50	55.62	53.87	49.87	47.62	43.87	40.25	33.12	32.87	28.25	26.75	44.26
1929	68.12	73.12	64.37	57.87	50.00	51.12	63.12	68.12	68.50	68.00	65.62	63.50	53.46
1928	62.25	64.00	68.12	72.12	74.87	64.87	59.00	52.25	54.87	56.37	56.37	58.12	61.93
1927	58.50	61.62	60.5	57.5	61.87	64.00	65.75	66.50	64.75	63.75	59.37	61.37	52.12
1926	47.37	45.37	47.37	53.12	49.62	50.12	49.50	48.75	52.50	58.62	59.62	56.12	51.51

* Quarterly Bulletin of Agricultural Statistics, Dominion Bureau of Statistics, Ottawa, Canada.

Winnipeg average cash price, 1926-1945

-- 43.67

Prairie Farm Assistance 1 percent -

.44

Handling charges -

1.25

Freight**

7.48

Total costs

9.17

Swift Current average farm price

34.50 cents per bu.

** 22 cents per cwt.

Table 1V Average Yearly Prices per Cwt. of Live Stock at
Moose Jaw, Saskatchewan, 1928-1945.*

Year	Steers (over 1050)		Steers (under 1050)		Heifers	
	Good	Med.	Good	Med.	Good	Med.
1928	8.73	6.63	8.93	6.66	8.28	6.96
1929	8.64	6.55	8.90	6.55	8.53	7.29
1930	5.46	4.48	6.54	5.06	6.12	4.87
1931	4.82	3.62	3.68	2.54	4.67	3.50
1932	4.06	2.84	4.20	3.09	3.82	3.00
1933	3.06	2.03	3.21	2.19	3.00	2.12
1934	3.27	2.38	3.74	2.33	3.09	2.18
1935	4.51	3.12	4.70	3.12	3.83	2.78
1936	3.73	3.03	3.64	2.97	3.16	2.54
1937	4.76	3.94	4.91	3.66	4.17	3.26
1938	4.35	3.51	4.37	3.50	3.95	2.38
1939	5.50	4.69	5.29	4.70	4.84	4.15
1940	6.29	5.67	6.15	5.56	5.91	5.38
1941	7.41	6.74	7.39	6.78	7.05	6.42
1942	8.85	8.05	8.78	8.09	8.30	7.53
1943	10.54	9.11	10.54	9.31	9.65	8.66
1944	10.69	9.79	10.78	9.82	10.43	9.44
1945	11.00	10.01	10.83	10.05	9.93	9.00
Average	6.43	5.34	6.48	5.33	6.04	5.08

* Annual Market Review, Dominion Department of Agriculture, Marketing Service.

