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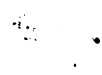
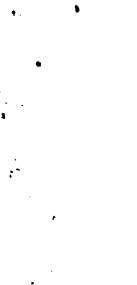
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Ph.D. degree in Agricultural  
Economics

*Raleigh Barlowe*  
Major Professor

Date April 9, 1954



AN APPRAISAL OF THE

JOHN T. ...

IN ...

Submitted to the Board of Trustees of  
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United States Department of Agriculture,  
and the Department of the Interior.

UNITED STATES DEPARTMENT OF AGRICULTURE

Department of Agriculture and the Interior

Year

Approved

*R. A. ...*

**AN APPRAISAL OF THE PRAIRIE FARM ASSISTANCE ACT**

by

Melvin E. Andel

**AN ABSTRACT**

Submitted to the School of Graduate Studies of  
Michigan State College of Agriculture and  
Applied Science in partial fulfillment  
of the Requirements for the Degree of

**DOCTOR OF PHILOSOPHY**

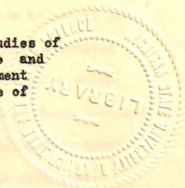
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**1954**

Approved

*Ralph Barlowe*





The Prairie Farm Assistance Act was established in 1939 to assist agriculture in western Canada. The program provided for payments to farmers of a maximum of \$500 when the yield of wheat was zero to four bushels per acre and a maximum of \$300 when the yield was more than four but not more than eight bushels per acre. A levy of one per cent was made on sales of grain through commercial channels and the money so raised was available for the payment of benefits. Additional funds required were obtained from the central treasury. Up to and including the crop year 1951-52, more than 143 million dollars were paid in benefits and collections under the one per cent levy amounted to 64.3 million dollars.

The operation of the program has raised questions as to its effect on resource allocation and on farm income stability. In addition, the actuarial structure of the insurance aspect of the Act and the effectiveness of the operating machinery warranted study. Basic data were obtained on all of the townships which had benefited under the Act between 1939 and 1949. These numbered nearly five thousand. Also, nearly 5,500 records on individual farms in a sample of 59 townships in Saskatchewan were used.

Compared with a model crop insurance program, the program of the Prairie Farm Assistance Act lacked some of the important requirements. The program involved continuous and substantial subsidies. Also, between farms there was an inverse relationship between risks and levy or premiums. Farms receiving the largest benefits paid the smallest premiums and vice versa.



Under certain conditions the program tended to promote misallocated resources as exemplified by the payment of benefits to farms on submarginal land. In addition, the payments were not large enough to improve resource allocation by removing the causes for risk aversion on the part of farmers and capital rationing on the part of lenders. The amount of stability provided was not sufficient to meet what is considered to be minimum stability requirements. Other limitations included the double tax on ineligible grain producers, the exemption of flax from the levy and lack of uniformity in the provision of benefits in the eight to twelve bushel category when the price of wheat drops below eighty cents per bushel.

In order that crop insurance functions can be more fully provided, it is recommended that, with the approval of the farmers, certain changes be incorporated into the Act. These include: a generally higher levy and one which takes into account the different categories of risk which exist between areas; maximum payments to farmers should be increased to provide a greater amount of stability and to remove causes for misallocated resources; payments to farms on submarginal land should be made conditional upon following certain practices; the levy should be placed on flax; all producers should be made eligible, or, exempt those from the levy who are ineligible for benefits; and the price policy feature of the Act should be made uniform for all categories.

# **AN APPRAISAL OF THE PRAIRIE FARM ASSISTANCE ACT**

by

**Melvin E. Andal**

## **A THESIS**

**Submitted to the School of Graduate Studies of  
Michigan State College of Agriculture and  
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**DOCTOR OF PHILOSOPHY**

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Mr. G. C. Bruce, General Superintendent, Prairie Farm Assistance Act, Regina, generously assisted in making available the basic data, office space and clerical assistance. Mr. R.A. Stutt, Regional Office Head, Economics Division, Canada Department of Agriculture, Saskatoon, and Professor H. Van Vliet, Head, Department of Farm Management, University of Saskatchewan, Saskatoon, provided invaluable assistance, particularly in the early stages of the study. Mr. J. K. Wiens, Economics Division, Saskatoon, helpfully obtained the basic data, did many of the laborious calculations and provided useful suggestions concerning the analysis. Dr. S. C. Hudson, Principal Economist, Economics Division, Department of Agriculture, Ottawa, first suggested this study, has read the manuscript and has made helpful suggestions.

4. The fourth part of the document discusses the challenges and limitations of the research process. It acknowledges that there are always potential biases and errors in data collection and analysis. However, it also points out that by following established research protocols and being transparent about the limitations, the results can still be valuable and informative.

5. The fifth part of the document provides a summary of the key findings and conclusions. It reiterates the importance of ongoing monitoring and evaluation to ensure that the project remains on track and that any necessary adjustments can be made in a timely manner. The text concludes by expressing confidence in the results and the value of the research for informing future decision-making.

Appreciation and thanks are also extended to Dr. J. F. Booth, Chief, Economics Division, Ottawa, and to Dr. Hudson for the arrangements under which this study has been made possible. The assistance of others who have helped in various ways is also gratefully acknowledged. The author, however, assumes responsibility for any errors which may have been made. Opinions expressed are those of the author personally and not necessarily those of any agency with which the study has been associated.

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## I. INTRODUCTION

The Prairie Farm Assistance Act first came into operation for the crop year August 1, 1939 to July 31, 1940. The measure was designed to relieve the burden of distressed conditions in western Canada. Under the Act provision was made for payments to farmers in case of crop failure and for collection from farmers of a one per cent levy on all wheat, oats, barley and rye sold to help pay for the program.

The Prairie Farm Assistance Act was introduced following a decade of conditions which placed an unbearable load on the shoulders of the farmers, and on municipal and provincial governments. The main feature of these conditions was the extremely variable and generally low crop yields. The average yield of wheat in Saskatchewan for the ten-year period from 1929 to 1938 was less than ten bushels per acre. In one year (1937), the average yield for the province was only 2.7 bushels per acre.<sup>1/</sup> Large sections of the province had no crop at all. Drought was the main reason for this particular failure. Other natural hazards which took their toll of crops during this period were rust, grasshoppers, sawflies and others of lesser importance. The variability and low level of these yields are shown in the following table on wheat yields.

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<sup>1/</sup> Annual Report, Saskatchewan Department of Agriculture, Regina, 1939, p. 54. The yields referred to are obtained by dividing harvested yield by total seeded acreage.

Table 1.- Average Wheat Yields 1929-1938 inclusive by Crop Districts

| Year | Crop District        |      |      |      |      |      |      |      |      | Province |
|------|----------------------|------|------|------|------|------|------|------|------|----------|
|      | 1                    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |          |
|      | - bushels per acre - |      |      |      |      |      |      |      |      |          |
| 1929 | 16.1                 | 7.9  | 6.8  | 13.2 | 14.3 | 10.6 | 12.1 | 19.6 | 13.9 | 11.1     |
| 1930 | 13.2                 | 10.7 | 8.0  | 13.1 | 15.2 | 10.4 | 18.9 | 22.9 | 27.8 | 13.7     |
| 1931 | 4.2                  | 1.1  | 2.4  | 5.0  | 10.2 | 7.8  | 12.7 | 21.4 | 22.7 | 8.2      |
| 1932 | 11.3                 | 10.4 | 7.7  | 15.1 | 16.6 | 11.0 | 16.3 | 21.4 | 20.1 | 13.0     |
| 1933 | 8.2                  | 12.1 | 3.7  | 4.0  | 23.1 | 5.3  | 3.8  | 16.3 | 14.1 | 8.4      |
| 1934 | 4.8                  | 4.8  | 3.6  | 4.3  | 18.1 | 8.2  | 8.6  | 16.7 | 18.1 | 8.6      |
| 1935 | 4.1                  | 7.0  | 11.0 | 6.7  | 9.3  | 13.1 | 10.1 | 15.5 | 13.6 | 10.2     |
| 1936 | 6.0                  | 9.9  | 4.7  | 1.3  | 17.7 | 10.6 | 5.3  | 14.4 | 8.1  | 8.0      |
| 1937 | 4.1                  | 1.5  | 0.2  | 0.1  | 7.7  | 1.2  | 1.4  | 10.6 | 5.8  | 2.7      |
| 1938 | 7.8                  | 9.7  | 6.6  | 9.5  | 14.8 | 8.9  | 1.2  | 13.3 | 8.6  | 9.6      |

Source: Annual Reports, Saskatchewan Department of Agriculture

In addition to the generally low level and variable yields indicated in Table 1, there is also much yield variability within crop districts. Each district comprises several million acres. While the average yield in some years may not have appeared to be seriously low, many areas within the district had a complete crop failure. Such differences resulted from variations in local conditions of rainfall, plant disease and insect infestations. Average yields for crop districts, therefore, do not show the variability within areas. Crop failures were, therefore, even more serious than might be indicated by average yields for crop districts. This aspect of yield variability is an important one in consideration of crop insurance schemes.

The other main characteristic contributing to the plight of western agriculture during this period was the extremely low level of agricultural prices. The agricultural sector of the economy suffered even more than other sectors in this respect. The average farm price for wheat in Saskatchewan for the period from 1930 to 1939 was only 60 cents per bushel and was as low as 35 cents per bushel in 1932. The average price for oats in the same period was 22 cents per bushel and in 1932 went as low as 13 cents per bushel.

Prices of livestock and livestock products were similarly low. Cattle sold for as little as a cent per pound and the ten-year average farm price for the most common grade of steers in Saskatchewan from 1930 to 1939 was less than three cents per pound. The average price of hogs in the same period was seven cents per pound and in 1932



averaged three cents per pound. <sup>2/</sup> The index of wholesale prices based on 1926 equals 100 for all commodities was 77 while that of farm products was 69. In 1932, the year of lowest prices, the index of wholesale prices for all commodities was 67 while that of farm products was only 48. The index for field products in 1932 was 41. <sup>3/</sup> Thus, prices of all commodities and particularly those of agricultural products fell to very low levels during this decade.

The combination of these factors, low yields, and low prices, resulted in an unprecedented burden being placed on the farmers, municipal and provincial governments and others whose prosperity was linked with that of the farmer. These conditions resulted in the accumulation of large debts on the part of the farmers and municipal and provincial governments.

Tax collections by municipalities were meagre during this period. In 1939, collections in rural municipalities in Saskatchewan were only 29 per cent of the current levy and arrears. This figure was as low as 8.5 per cent in 1937. Accumulated arrears of taxes were 62 million dollars in 1936 and would have exceeded 70 million dollars in 1937 if the debt cancellation program resulting in the cancellation of 21 million dollars of tax arrears had not taken place.

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<sup>2/</sup> Annual Market Review, Marketing Service, Canada Department of Agriculture, Ottawa.

<sup>3/</sup> Economic Annalist, Canada Department of Agriculture, Ottawa, Volume XIII, No. 4, (November 1943), p. 58.

Because of the inadequate tax collections, municipalities had to borrow to the full extent of credit available. In Saskatchewan, seed grain and relief loans from the provincial government exceeded 16 million dollars in 1939. Net debenture debt was over four million and loans from banks for seed grain and relief totalled nearly 27 million dollars. Aid and relief advances receivable in 1939 amounted to more than 71 million dollars.<sup>4/</sup>

Local governments in the other prairie provinces faced similar but somewhat less severe financial difficulties. Saskatchewan had the largest area affected by drought in the three provinces and was likely the hardest hit.

The farmers themselves fared no better. Farm mortgage debts in Saskatchewan amounted to 188 million dollars in 1936. In addition, there were 12 million dollars in farm debt covered by lien. Direct relief, agricultural aid, arrears of taxes, debts to implement companies and banks and other types of debt brought the total estimated agricultural debt to 525 million dollars. At the same time, cash agricultural income in Saskatchewan was less than 52 million dollars in 1937.<sup>5/</sup> The value of agricultural land in 1936 was about 616 million dollars.<sup>6/</sup> Thus, the agricultural debt was nearly as great as the value of the land and agricultural debt had, therefore, assumed very serious proportions.

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<sup>4/</sup> Figures on financial aspects of rural municipalities obtained from Annual Reports, Saskatchewan Department of Municipal Affairs, Regina.

<sup>5/</sup> Britnell, G.E., The Wheat Economy, University of Toronto Press, Toronto, 1939, pp. 88-89.

<sup>6/</sup> Census of Prairie Provinces, 1936, Dominion Bureau of Statistics, Ottawa, 1938, p. 696.

Even with such large amounts of credit and substantial relief payments, the standard of living of the farm family had dropped to chronically low levels. The repeated drought years devastated farm gardens and the diet consisted chiefly of meat, bread and potatoes. The maximum monthly food allowance for a family of five under the Saskatchewan Relief Commission in 1933-34 was ten dollars plus one 98 lb. bag of flour. Under various agencies this allowance rose to twenty dollars in 1937 with no separate allowance for flour.<sup>7/</sup> The Federal Minister of Agriculture stated that medical men had seen signs of scurvy and that it was apparent that there had been a shortage of vegetables and fruit in the diet of people on relief.<sup>8/</sup>

Clothing requirements were met almost entirely by cash expenditures and for this reason only the bare essentials of work clothing were obtained. Homes and furnishings, too, were such as to provide only the essentials of shelter and living. Very few farm homes had electric power or running water. There was little time or money for leisure. From the time spring operations began until "freeze up" there were only long days of hard work and no opportunity for holidays or recreational activities.<sup>9/</sup>

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<sup>7/</sup> Food Schedule for Rural Municipalities, Villages and Towns, Bureau of Labour and Public Welfare, Department of Municipal Affairs, Regina.

<sup>8/</sup> The Hon. J.G. Gardiner, as reported in the Regina Leader Post, September 23, 1937.

<sup>9/</sup> For more detail on living conditions during this period see Britnell, G.E., op. cit., Chapter 7.

The other prairie provinces faced similar but somewhat less severe conditions. In Manitoba, in 1936, farm mortgages amounted to 51 million dollars and debts covered by liens amounted to 2.3 million dollars. In Alberta, mortgage debts amounted to 108 million dollars and in addition there was over 5.5 million dollars in farm debt covered by liens.<sup>10/</sup>

In the face of these and other credit requirements, the Federal Government was called upon to provide financial assistance. Nearly one million dollars was provided for the purchase and distribution of foodstuffs in drought areas of Saskatchewan and Alberta from 1937 to 1939. Land settlement assistance amounted to over one-half million dollars. Direct feed and fodder relief amounted to over three million dollars in 1936-37, more than twenty million in 1937-38 and to more than eight million dollars in 1938-39. Federal expenditures in conservation works and Prairie Farm Rehabilitation amounted to five million dollars between 1935-36 and 1938-39.<sup>11/</sup>

In spite of the considerable credit and relief assistance that was forthcoming, the assistance provided was emergency assistance of a temporary nature and it was evident that an adequate long-term

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<sup>10/</sup> Census of Prairie Provinces, Dominion Bureau of Statistics, Ottawa, 1936.

<sup>11/</sup> Cameron, Marjorie R., and Frank Shefrin, Federal Agricultural Assistance Programs, Canada, 1901-1951, Economics Division, Canada Department of Agriculture, Ottawa, April 1952.



solution had to be found for the problems arising out of the unstable agricultural economy. The establishment of the Prairie Farm Assistance Act was a measure designed to provide a more permanent solution to the problem.

In presenting the Bill to Parliament, Mr. Gardiner, the Minister of Agriculture, pointed out that the proposal provided for per acre payments to farmers rather than per bushel payments. Per bushel payments he said did assist farmers who had crops but did nothing to assist farmers who had no crop. The Act was designed to assist farmers who had crop failure.<sup>12/</sup>

With regard to the one per cent levy, Mr. Gardiner compared the Act with pension and unemployment insurance schemes for employees. He stated: <sup>13/</sup> "... the proposal is a measure to take one per cent of all grain that comes to the terminals, sell that grain, put the money in a fund and then, if necessary, contribute to that fund from the Treasury in very much the same way we do now in our schemes for provision of insurance payments to unemployed under an employment scheme."

Speaking again on May 5, 1939, in support of the Bill, the Minister of Agriculture gave reasons why wheat growers should receive this consideration. He stated: <sup>14/</sup>

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<sup>12/</sup> House of Commons Debates, Ottawa, 1939, p. 2625.

<sup>13/</sup> Ibid., p. 2626.

<sup>14/</sup> Ibid., p. 3641.

I would base it partly upon the fact that these subventions have been paid to others but even more than that I would base it upon the fact that this very year we are providing in the Estimates now before this House an amount of 27 million dollars the greater part of which will be spent in the industrial areas of the east and the extreme west for the purpose of maintaining in those areas where industry is established the labour that is necessary in order to operate those plants in time of prosperity. That is as much as we have ever asked in any legislation brought into this House. That money is paid out most in relief for no other purpose than to maintain men who are employed in our factories prior to the period of depression, producing commodities which were sold both within and without this country. It is paid to maintain them until such time as these people may be able to produce again and sell to advantage the products of industry. I repeat that if it is a proper thing for the Dominion Parliament to vote money for that purpose it is a proper thing for this Parliament to provide money to maintain upon the farms of the wheat producing areas of the west those farmers who in years gone by produced so much wealth and made it available for the purchase of goods coming from all sections of this country thus maintaining men in employment in industry throughout these years. I maintain that we should do this in order that if difficult years should return we may have in the west men who would produce those foodstuffs which will not only enter greatly into our trade but become essential for the preservation of those who may be called upon at some time in the not too far distant future to defend this and other parts of the Empire.

This was the setting in which the Prairie Farm Assistance Act was born. The Act was passed on June 3, 1939 to become effective for the first time in the 1939-40 crop year. Up to and including the crop year of 1951, more than 143 million dollars had been paid to western farmers under the Act. Payments have been made every year except for the 1942-43 crop year. Saskatchewan has received the largest benefits under the Act, the payments to this province amounting to more than 103 million dollars. Alberta, including the Peace



River Block of British Columbia, has received the next largest share with nearly 36 million dollars. Manitoba has received a little more than three million dollars, and the highest payment was 20.5 million dollars in 1949. Payments have averaged about 11.9 million dollars per year for each year that the Act has been in operation.

Collections from farmers under the Act in the form of the one per cent levy have amounted to 64.3 million dollars up to and including the 1951-52 crop year. More than one-half of this, about 35.2 million dollars came from Saskatchewan, 18.6 million came from Alberta and about 10.5 million from Manitoba.

Administrative expenses up to and including the 1951 crop year were a little more than four million dollars. The largest administrative expenses were incurred in the 1947-48 crop year and amounted to nearly one-half million dollars.

#### Objectives of the Study

A program of this kind which involves an expenditure of nearly twelve million dollars and levies of about five million dollars per year implies a number of problems. It is immediately evident that, as a group, western farmers receive benefits which are more than double the costs of the scheme to them. The question arises as to the justification for this redistribution of income. A similar question arises within the group of farmers themselves. The application of a one per cent levy on grain sold and payments to farmers experiencing crop failure is a type of crop insurance. The appli-

cation of a uniform levy and rate of payments over large areas which differ in their susceptibility to crop failure and in average crop yields raises questions as to whether the incidence of costs and benefits are equitable between areas within the region covered by the plan.

Another aspect of the program relates to the possible effect of these payments on farms and on farm practices. It has been claimed that the Prairie Farm Assistance Act is conducive to larger wheat acreages. A program, which in some areas, makes payments considerably in excess of the cost to farmers of those payments also gives rise to claims that the program keeps submarginal farms in grain production when in the normal course of events such land would revert to some other use.

Another aspect of inquiry concerns the effect of the Act in providing a reasonable measure of stability and security to the farm family. The aggregate payments to farmers under the Act are considerable. The aggregate figures, however, do not indicate the extent to which the payments to individual farmers stabilize their income. They do not show the extent to which the needs of farmers are met in crop failure years, or more specifically, they do not show the proportion of cash farm expenses or living expenses which are provided by these payments.

A large program of this kind imposes administrative difficulties. The general purpose of the Act is to provide assistance to farmers who

need it. The yield of wheat has been selected as the indicator of need and the average yield of wheat in a small area has been selected as the basis for indicating individual needs within that area. These tools which are used to implement the basic purpose of the Act need to be examined for limitations and effectiveness. Finally, an appraisal of the Act allows a consideration of alternatives. This consideration is confined mainly to alternatives within the general framework of the Act. It would also examine crop insurance experience in the United States for the purpose of determining which of the features of insurance there, would find useful application to western Canada.

More specifically, the objectives of this study may be enumerated as follows:

1. To determine the incidence of costs and benefits of the program operating under the Prairie Farm Assistance Act.
2. To determine the effect of payments under the Act on farms and farm practices.
  - (i) Resource allocation: to determine the effect of payments to farmers under the Act on;
    - (a) land use;
    - (b) resettlement;
    - (c) capital movements and rationing.
  - (ii) Stabilizing farm income.
    - (a) Proportion of cash farm expenses covered by Prairie Farm Assistance Act payments;
    - (b) proportion of cash living expenses covered by Prairie Farm Assistance Act payments;
    - (c) the effect of price level on (a) and (b).

3. To determine the effectiveness with which the program accomplishes its stated purpose.

(i) To determine adequacy of average township yields in determining needs of individual farmers within that block.

(ii) To determine adequacy of wheat yields as an indicator of need for assistance under the Act.

(iii) To determine flexibility in definitions of farm units to maximize benefits under the Act.

(iv) To determine adequacy of yield information obtained.

(v) To determine the adequacy of the price policy feature of the Act.

4. A consideration of alternatives.

(i) To indicate desirable adjustments in the Act in the light of specific economic and social objectives.

(ii) To show a comparison of the program under the Act with the previous relief program.

(iii) To indicate the place of crop insurance on the prairies.

#### Source of Data

Records of the Prairie Farm Assistance Act administration provided the major source of primary information used in this study. Various farm survey records obtained by the Economics Division, Canada Department of Agriculture and the Farm Management Department, University of Saskatchewan provided additional primary data. Books, reports and publications published by various agencies were also used.



Two types of information were obtained from the files of the Prairie Farm Assistance Act administration. The first was summarized information for each township which had received benefits under the Act. A township is an area six miles by six miles and contains 36 sections of land each of which contains 640 acres. The following information was recorded for each of the 4,968 townships that had received benefits under the Act between 1939 and 1949.

- 1) Year or years of payment;
- 2) number of farmers paid;
- 3) total amount paid;
- 4) category of payment; and
- 5) legal description of the township.

The second type of Prairie Farm Assistance Act information was that concerning individual farm units. A sample of farms in Saskatchewan was selected and the following information was recorded for each farm.

- 1) Location of the farm;
- 2) year of benefit;
- 3) land use;
- 4) number of quarter sections leased for pasture;
- 5) category of payment or refusal;
- 6) grain production;
- 7) cattle, sheep and hog numbers; and
- 8) Prairie Farm Assistance Act payments.

Five thousand four hundred and fifty such records were obtained for the five year period between 1945 and 1949. These records involved about 2,500 farms since some of them were recorded in successive years.



### Method of Study

The first type of information referred to above - township data - provided general background information on the size and extent of the program. It provided data on numbers of farmers obtaining payments, on the amount and category of those payments together with the geographic location of the beneficiaries. It also provided information which permitted the calculation of an index of payments for each of the 4,968 townships which had benefited under the Act during the ten years it had been in operation up to and including 1949.

Some of the more detailed analyses, in particular that pertaining to relation between costs and benefits to specific groups of farmers and that pertaining to the establishment of farm budgets, were based on the second type of information referred to above - information on farm units. Since there were about 300,000 farms in the prairie provinces it was necessary to select a sample of farms on which to carry on this phase of the analysis. Saskatchewan has been the largest provincial participant in the program, having received the largest benefits and having paid the largest part of the one per cent levy. In addition, yield information, soil surveys, and land classification data were more readily available in this province. It was, therefore, decided to select the sample of farms in Saskatchewan. Farm unit data were not available for the years previous to 1945 and was therefore recorded only for the years 1945 to 1949 inclusive.

The principle observed in selecting the sample was to obtain a group of farms which would be representative of the major kinds and types of farms in Saskatchewan. At the same time, the sample was to be representative of the various kinds of benefit received under the Act. Descriptions of farms and assistance experience were classified on a township basis. The unit of selection was, therefore, the township. Townships had an average of about forty farms.

Because of the limited number of farms which would be included in the sample, it was considered that the farms selected would likely be more representative of the majority of the farms if some of the off-types were not included. Localized types of farms or settlements of farms which were different in their characteristics than the large majority of farms were not included. These were first isolated by excluding those townships with less than fifteen, or more than fifty farms per township in the prairie area and those with less than thirty, or more than seventy farms per township in the park area. Because of the more extensive type of agriculture existing in the prairie area, farms were larger and for this reason there was a difference in numbers of farms per township in the two areas.

The lower limit on numbers of farmers per township was established to exclude those townships which were only partially occupied. In some localities in the prairie area there were areas of wasteland, ranches and community pastures. In the park area there were localities which had not been wholly settled or developed and which may also have contained wasteland. In these cases the number of farmers per township

was small. The inclusion of some of these townships in the sample would have given more than proportionate weight to these types of agriculture.

The upper limit on numbers of farms per township was established to exclude from the sample those townships where generally because of social custom there happened to be an unusually large number of farmers per township. In the park area, there was an additional factor accounting in some cases, for a large number of farmers per township. After the initial settlement phase had been completed, farmers held small units and had not yet enlarged them to the point where there could be considered to be a normal type of agriculture. Since this type of development was a small part of the total it was considered that the inclusion of some of these townships in the sample would have given more than proportionate weight to these types of organization.

A third class of township was also eliminated. This group consisted of those townships in which the number of farms varied greatly from year to year. They may have been characterized by an unstable settlement pattern or they may have been townships in which there was a possibility of them not having been classified as "part townships" under the Act. Variation in some cases, too, was due to the fact that farmers were classified some years as eligible for benefits and other years as not eligible. This would have given rise to some variation in numbers of farms per township.

There were 2,295 townships in Saskatchewan that received benefits under the Act at least once during the five year period 1945 to 1949. Of these, 192 were eliminated from the total by establishing the lower limit, 49 were eliminated with the establishment of the upper limit of farm numbers per township and 44 were eliminated because there was a variation of ten or more farms in the township from one year to the next. These totalled 285 and subtracted from the total leave 2,010 townships to be represented by the sample.

To this point, the process of sample selection has been concerned with eliminating the extremes. The sample, of course, is not representative of that group of farms. The next phase of sample selection was concerned with obtaining a representative sample from the remaining townships. These townships were first classified according to number of times payments were received and by index of payment.<sup>15/</sup> From this cross-classification, modal groups of townships were selected, covering the whole range of payment experience. Three hundred and fifty-five townships in some of the intermediate degrees of payment experience were eliminated in the selection of these modal groups. Under provisions of the Act, payment could be made to groups of farmers in one of two ways. They could be made to all farmers of a township or they could be made to farmers within a "block" of that township. The

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<sup>15/</sup> The "index of payment" is an index of the amount of payments that farmers have received under the Act. It takes into consideration the amount as well as the number of times that payment has been received.



block varied in size from one-quarter to three-quarters of the area of the township. Of the total number of townships receiving some payment during 1945 to 1949, nearly one-half of them had payments made to only a block of farms within those townships. It is very difficult to obtain most kinds of statistical data for parts of townships. Also, there is no reason to believe that farms in townships where "block" payments had been made were any different than farms in townships where payments had been made to the whole township. Furthermore, this phase of the study was concerned with the relation between payments and costs to the farmer and with the effect that the Prairie Farm Assistance Act program would have on stability of farming. For these reasons, townships which had payment to only part of their farmers were not included in the sample. Although this excluded those blocks in which the average township yield tended to be near eight bushels per acre, townships within the whole range of payment experience were included in the sample. The number of townships eliminated for having experienced only partial payment in one or more years was 1,101. This left 554 townships from which the sample was taken.

Although the sample was selected from 554 townships, it would be considered to represent the whole range of farm characteristics except the 285 "extremes" that were excluded early in the process of sample selection. The 355 farms eliminated in the selection of modal groups with respect to payment experience represented various intermediate degrees of payment experience and the 1,101 townships eliminated because of payments being made to only blocks within them were similar to townships receiving full payments except in respect to the size of the area receiving payment.



The 554 remaining townships were then stratified according to payment experience, soil zone, which includes a general geographic climatic and soil characteristic stratification, soil productivity and more specific geographic location. Fifty-nine townships were randomly selected within the strata. This represented 9.4 per cent of the 554 townships or 3.4 per cent of the 2,010 townships which they may be considered to represent.

A third aspect of the study was concerned with determining the adequacy with which average wheat yields indicate the need of individual farmers and for this purpose another sample of farms was selected. This aspect of the study was undertaken to determine the proportion of individual farmers who had actual yields within the category in which they were paid. Because categories of payments to farmers were determined by the average yields of groups of farms, individual farms had yields outside of the yield payment category in which the group was paid.

The degree to which yields of individual farmers fall within the category in which they were or were not paid could most readily be determined by examining those townships, of which only a part, qualified for payment. Records for these townships would show not only how many farmers receiving payment had yields outside of the payment category but also how many ineligible farmers not receiving payment actually had yields within an eligible category. Records of townships in which all farmers qualified for payment would not give any

information on numbers of ineligible farmers, who have in reality, yields within the eligible range.

This sample, therefore, was selected only from those townships to which payment was made to only some of the farmers. In Saskatchewan, nine townships were in this category four times in the four years they received benefits under the Act during 1945 to 1949. Five townships were in this category four times in the five years they received benefits and two townships were paid as part townships five times in the five years they benefited. Out of these groups, four, two and one townships, respectively, were randomly selected for study.

The average yield of wheat in the sample is 10.5 bushels per acre on which average 100 bushels per acre is the standard. The yield of wheat or black is seen that the yield is 10.5 bushels per acre. The yield of wheat within that area is 10.5 bushels per acre. The yield of wheat in the fields. There are three categories of wheat:

1. If the average yield of wheat in a township is more than eight and not more than twelve bushels per acre, the wheat is ten bushels per cultivated acre for each acre of the field. If the yield is not exceeding ten bushels, the average yield is less than eight bushels per acre. The yield of wheat is defined here as the average of the daily yields of wheat of No. 1 bushels. Northern wheat is eight bushels per acre. The yield of wheat is defined here as the average of the daily yields of wheat of No. 1 bushels.

✓ The Prairie Farm Rehabilitation Act, R.S. 1927, c. 40, passed June 2, 1927, as amended, and Regulations passed under the Act. The Regulations I for a copy of the Act as recorded in Chapter 213, Statutes of Saskatchewan, 1927.

## II. A DESCRIPTION OF THE PRAIRIE FARM ASSISTANCE ACT <sup>1/</sup>

Although the Prairie Farm Assistance Act has been amended several times since its inception in 1939, these changes will not be described in detail here. Rather, the Act will be outlined as it operated in 1953. It will, however, be necessary to refer, from time to time, to some of the more important changes which have occurred during the period it has been in operation.

### Basis of Awards

The average yield of wheat in a township or block is the basis on which awards are made. If the average yield of wheat in a township or block is such that the area is eligible for payment, then all farmers within that area receive awards irrespective of their individual yields. There are three categories of awards:

1. If the average yield of wheat in a township is more than eight and not more than twelve bushels per acre, the award is ten cents per cultivated acre for each cent or fraction thereof not exceeding ten by which the average price is less than eighty cents per bushel. Average price is defined here as the average of the daily closing prices of No. 1 Manitoba Northern Wheat in store at Fort William-Port Arthur between

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<sup>1/</sup> The Prairie Farm Assistance Act, S.C. 1939, C. 50, passed June 3, 1939, as amended, and Regulations passed under the Act. See Appendix I for a copy of the Act as recorded in Chapter 213, Revised Statutes of Canada, 1952.

the 31st day of July and the first day of November. The maximum award that can be made in this category is one dollar per acre.

2. If the average yield of wheat in the township is more than four and not more than eight bushels per acre, the award is one dollar and fifty cents per cultivated acre.
3. If the average yield of wheat in the township is not more than four bushels per acre the award is two dollars and fifty cents per cultivated acre.

In the zero to four bushel category the minimum award is \$200. A farm must have at least twenty-five acres under cultivation in order to qualify for this award unless the farm is in the development stage. A farmer must have at least one-half of his cultivated land in the eligible township to qualify for the minimum award of \$200. For farms in the four to eight bushel category the maximum award is \$300 and for farms in the zero to four bushel category the maximum award is \$500.

Awards payable under the Act are exempt from the operation of any law relating to bankruptcy, or insolvency or to garnishment or attachment and are not assignable either at law or in equity. The farmer is thus assured of some minimum amount of money in a crop failure year to meet his most pressing expenses.

In the Act, as originally passed, the average yield of wheat in the township was the basis on which awards were determined. Experience indicated, however, that there were too many farmers within



eligible townships who had yields in excess of the yield categories in which they were paid. Also, within those townships whose yields were sufficiently high to make them ineligible for awards, there were too many farmers with yields below eight bushels per acre but who could not be given awards because the townships were ineligible. Thus, yields within townships were considered too variable to provide a reasonable degree of justice by having an area as large as a township serve as the basis for award. The Act was successively amended to make provisions for awards on the basis of smaller areas.

The Act now provides that where a block of contiguous sections of land, within an eligible township having an area of not less than one-sixth of the township and the side that lies along the boundary of an ineligible township, is determined to have an average yield of more than ten bushels per acre, such block of sections of land is ineligible for award. On the other hand, where a block of contiguous sections of land, within an ineligible township having an area of not less than one-sixth of the township and a side that lies along the boundary of an eligible township, is determined to have a yield of eight bushels of wheat or less per acre, such block of sections of land are eligible for award as though it were a complete township. An isolated block of land not contiguous to an eligible township is required to have an area of not less than one-half of the township with a yield of eight bushels of wheat or less per acre to qualify for award. Thus, the size of the area for which average yields are calculated and on which



categories of awards are determined, has been reduced from a township (36 square miles) in size to only six square miles. There is, therefore, the likelihood of a closer relationship between yields of individual farmers and the average yield in the case of six square mile areas than in the 36 square mile areas.

#### Restrictions on Awards

Awards can be made on only one-half of the cultivated land of the farmer, and on a maximum of 200 acres. If a farmer owns land in more than one township the maximum acreage on which he can receive award in the township in respect of which the award is made, is in the same proportion to 200 as the number of acres of cultivated land that the farmer has in this township to the total number of acres of cultivated land that he has in all eligible townships. Thus, a farmer who has land in two or more townships having different categories of award, will receive awards for the land in each township according to the proportion of such lands to his total cultivated acreage.

Certain lands are excluded from benefiting under the Act. These are farms operated as Experimental Farms, market gardens, farms used for ranching purposes, farms operated by Indians within Indian reservations, farms declared submarginal and ordered evacuated under provisions of provincial statute, irrigated land on which the yield per acre is more than twelve bushels of wheat or the equivalent value of other crops, or any farm unit containing more than fifty acres of irrigable land that forms part of an irrigation system except when the yield per

acre on the irrigable portion of the land in it is twelve bushels or less of wheat or the equivalent in value of other crops.

The owner or tenant is not a farmer for the purposes of the Act unless he is the owner or tenant of a farm from the first day of May until the first day of November in the same year, unless he lives in the spring wheat area and his primary occupation is farming from the first day of May until the end of the crop season, unless he is responsible for farm operations and the disposal of the proceeds of the farm and if renting from a parent unless he has a written lease executed prior to the first day of May of the year of the award.

An amendment of June 1950 provided that all lands disposed of after 1940 by the Federal, provincial or municipal governments were not eligible for awards under the Act, except land granted to veterans under the Soldier Settlement Act or the Veterans' Land Act, 1942. The Minister of Agriculture said that in general the amendment dealt with " ... lands which up to a certain date everybody considered were not good enough either to homestead or to buy".<sup>2/</sup> The amendment was passed so that the Act would not provide encouragement for the placing or maintenance of this generally submarginal land in cultivation. The reason for the 1940 cut-off date was that the western provincial governments had stopped homesteading on Crown lands in 1940. A later amendment passed in April 1953 excluded northern Manitoba and northern

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<sup>2/</sup> The Saskatoon Star Phoenix, Saskatoon, May 3, 1950.

Saskatchewan from the provisions of the 1950 amendment since good new agricultural land was being settled in this area. The intent of the 1950 amendment was to exclude submarginal lands from benefiting under the Act.

#### How the Program is Financed

In order to help pay for the Prairie Farm Assistance Act program, a levy of one per cent is made on sales of wheat, oats, barley and rye. Only grain grown by Indians in Indian reserves is not subject to this levy. The price for grain is on the basis in store at a terminal elevator and deductions of charges for freight, elevation, inspection, weighing and cleaning are made before calculation of the levy. Such deductions are placed in the Prairie Farm Emergency Fund. Money from this Fund is used to pay awards to farmers who experience crop failure. Any additional amounts required for this purpose are paid out of the Consolidated Revenue Fund. Advances out of this Fund are to be repaid out of the Prairie Farm Emergency Fund without interest. All administrative, including travelling and other expenses, incurred under this Act, are to be paid out of moneys provided by Parliament for this purpose.

#### General

When no wheat is seeded in a township, the yield of rye, oats, or barley whichever predominates is used as the index for the purpose of determining the eligibility of the township. Where rye is taken as the index, the yield per acre of rye is deemed to be that of the

yield of wheat. Where oats or barley is taken as the index, two-thirds of the yield per acre of oats or barley is deemed to be the yield of wheat.

The above presents the principal characteristics of the Act as it now operates. There have been some important developments which in some respects make the Act considerably different than it was when originally set up. Some of these have already been referred to and other changes, which are pertinent to the analysis, will be indicated during the course of the dissertation.



### III. AGRICULTURE IN THE PRAIRIE PROVINCES

#### Climate

The agriculturally settled portions of the Prairie Provinces form a part of the physiographic unit known as the Interior Continental Plain or Great Plains region. This region can be divided into two general areas, the open treeless plains or prairie area and the park area which is characterized by varying degrees of tree cover from isolated groves to solid forest cover. This distinction is significant because of the differences in climate and agriculture in the two areas. The park area is more humid than the prairie area. Although the difference in rainfall between the two areas is not great, there is a large difference in moisture available for plant growth. Higher temperatures prevail in the prairie area and these, together with warm dry winds, give rise to a considerable loss of moisture by evaporation. The amount of moisture remaining for plant growth is even less than the limited amount of rainfall would suggest. The extent of plant growth depends largely, then on the amount of moisture available. The difference in rainfall and soil moisture efficiency between the prairie and park area results in different farm practices and types of agriculture in the two areas. Agriculture in the prairie area is more extensive and consists mainly of wheat production and some ranching. In the park area, grass and coarse grains grow well with the result that a mixed type of farming is more in evidence than in the prairie area.





Table 2 gives information on the climate at representative points in Saskatchewan. The soil zone climatic index is a composite figure taking precipitation, temperature and evaporation into consideration. It is directly related to soil moisture efficiency. Thus, the soil moisture efficiency at Melfort is double that at Swift Current even though there is not a great difference in average precipitation.

Table 2.- Climatic Data for Representative Stations in Saskatchewan.

| Area and Station | Average annual<br>temperature <sup>1</sup> | Average annual<br>precipitation<br>(April-October) <sup>2</sup> | Soil zone<br>climatic<br>index <sup>1</sup> |
|------------------|--------------------------------------------|-----------------------------------------------------------------|---------------------------------------------|
|                  | F°                                         | inches                                                          |                                             |
| Prairie area:    |                                            |                                                                 |                                             |
| Swift Current    | 38                                         | 11.33 <sup>3</sup>                                              | 30                                          |
| Regina           | 33                                         | 11.35 <sup>3</sup>                                              | 44                                          |
| Park area;       |                                            |                                                                 |                                             |
| Prince Albert    | 32                                         | 11.99 <sup>3</sup>                                              | 59                                          |
| Melfort          | 31                                         | 12.10 <sup>4</sup>                                              | 60                                          |

1 Mitchell, J., H.C. Moss and J.S. Clayton, Soil Survey, Soils Department, University of Saskatchewan, Saskatoon, Saskatchewan, No. 12, 1944, p. 20.

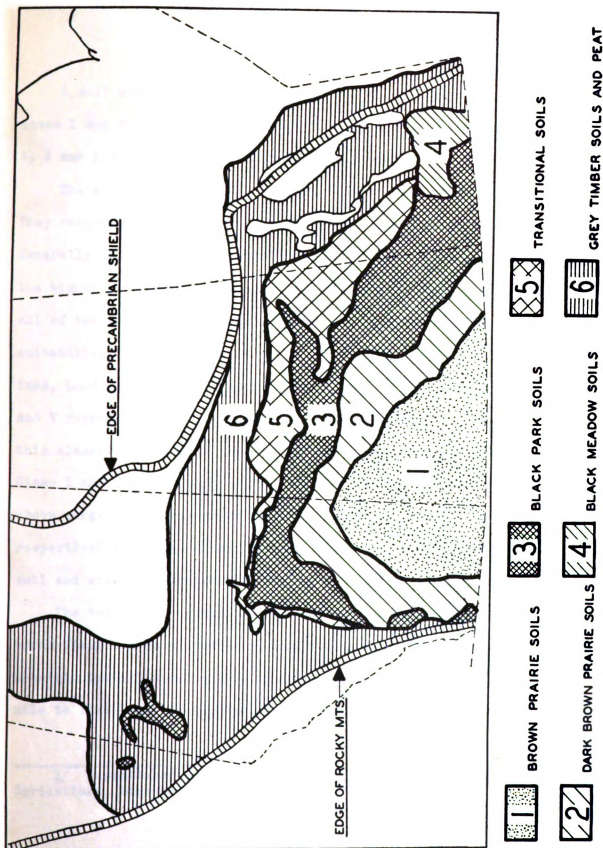
2 Champlin, M.J., E.G. Booth, R.O. Bibbey and C.G. Wayell, Rainfall Records for Saskatchewan, Field Husbandry Department, University of Saskatchewan, Saskatoon, Saskatchewan, Bulletin 18, pp. 9-10.

3 44-year average 1906-1949.

4 34-year average 1916-1949.



FIGURE 1  
PRAIRIE SOIL MAP





### Soils

A soil zone map for the prairies appears in Figure 1. Soil zones 1 and 2 are in what is called the prairie area and soil zones 3, 4 and 5 are in what is called the park area.

There is a wide variety of soils within the prairie provinces. They range from sand-dunes and rock outcroppings to heavy clay. Generally, the heavier the soil the more productive it is because of the higher moisture holding capacity and drought resistance. Nearly all of the prairie area in Saskatchewan has been classified as to its suitability for wheat production. Land Class I represents submarginal land, Land Class II represents marginal land and Land Classes III, IV, and V represent various grades of supramarginal land. According to this classification 11.2 per cent of the total improved area is Land Class I and 27.4 per cent is Land Class II. The percentages for the above margin Land Classes of III, IV, and V are 36.6, 14.3 and 10.5 respectively.<sup>1/</sup> This classification indicates the wide variation in soil and economic productivity within the prairie area.

The topography of the prairie provinces is generally smooth. The broad plain has an elevation of 3,000 feet to 3,500 feet in the Rocky Mountain foothills and slopes eastward and northward a few feet per mile to less than one thousand feet on the eastern border.

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<sup>1/</sup> Unpublished material, Economics Division, Canada Department of Agriculture, Saskatoon, Saskatchewan.



### Type of Farming

These physical features together with the economic implications of location and the general relationship of prices determine to a large extent the types of agriculture which exist. Figure 2 shows the type of farming areas in the prairie provinces. The map shows the predominance of wheat in the prairie economy. The wheat specialty area covers most of the agricultural area and, in addition, wheat occupies an important place in the mixed and livestock farming areas. Thus, it is seen that the prairie provinces, Saskatchewan in particular, depend largely on a wheat economy.

Table 3.- Gross Revenue by Source for the Prairie Provinces, 1950.

| Source                                   | Province |              |         |
|------------------------------------------|----------|--------------|---------|
|                                          | Manitoba | Saskatchewan | Alberta |
| - million dollars -                      |          |              |         |
| Grains                                   | 97.2     | 240.5        | 127.5   |
| Hay and forage                           | 1.5      | 2.4          | 6.9     |
| Potatoes, roots and other<br>field crops | 2.4      | 0.3          | 6.5     |
| Vegetables                               | 0.5      | 0.2          | 0.7     |
| Cattle                                   | 27.9     | 53.6         | 87.4    |
| Dairy products                           | 14.0     | 15.4         | 29.3    |
| Poultry and eggs                         | 6.6      | 5.7          | 7.6     |
| Swine                                    | 9.5      | 10.6         | 34.5    |
| Horses, sheep and wool                   | 0.9      | 1.9          | 4.9     |

Source: Census of Canada, 1951, Volume VI, Part II.

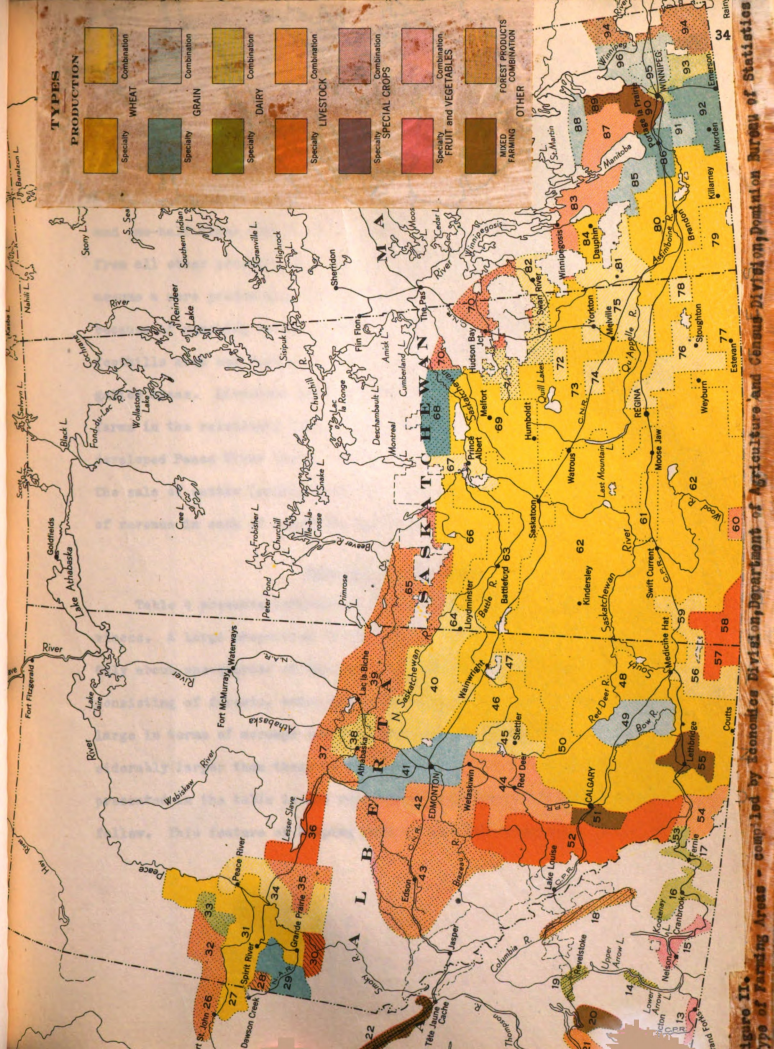






Table 3 shows the significance of the various enterprises. In each of the provinces, grain provided the largest single source of revenue. In Saskatchewan, the receipts from grain were about two and one-half times that from all other sources. In Alberta, receipts from all other products were greater than from grain. Livestock assume a more predominant role in Alberta than in the other provinces because of ranching in the southeast corner of the province and in the foothills area and because of the mixed farming carried on in the irrigation areas. Livestock have an important place, too, on the mixed farms in the relatively large park belt area including the more recently developed Peace River block. Manitoba was between these two positions. The sale of cattle (mainly beef) was the second most important source of revenue in each of the three provinces.

#### Land Use and Farm Size

Table 4 presents information on the use of land in the prairie provinces. A large proportion of the land is of no agricultural importance. Only about one-quarter of the land area is occupied by farms, the remainder consisting of forests, water and barren waste. The farms, however, are large in terms of acreage operated and farms in the prairie area are considerably larger than those in the park area. Another significant feature presented in the table is the relatively large amount of land in summer-fallow. This feature of keeping part of the land temporarily out of crop



production serves to replenish moisture reserves and to control weeds. In the prairie area, replenishment of moisture is more important and in the park area the primary function of summerfallow is to control weeds.

Grain crops were the most important product in the prairie provinces. Acreage of the principal crops is shown in Table 5. In Manitoba the acreage seeded to wheat was not much greater than that seeded to each of the coarse grains. In Alberta and Saskatchewan, however, the acreage seeded to wheat exceeded that seeded to oats and barley by a considerable amount.

Table 5.- Acreages per Farm of Wheat, Oats and Barley in the Prairie Provinces, 1951.

| Province      | Wheat | Oats | Barley |
|---------------|-------|------|--------|
| - acres -     |       |      |        |
| Manitoba      | 44    | 31   | 39     |
| Saskatchewan: |       |      |        |
| Prairie area  | 213   | 30   | 36     |
| Park area     | 79    | 33   | 20     |
| Alberta       | 76    | 34   | 24     |

Source: Census of Canada, Volume VI, Part II, 1951.

Cattle were the second most important source of income for farms in the prairies. The number of cattle per farm varied from nineteen in Alberta to eleven in the park area of Saskatchewan. There was an average of thirteen head in Manitoba and twelve in the prairie area

of Saskatchewan. Many farms in the prairie area did not have any cattle at all. Nearly thirty thousand Saskatchewan farmers reported having no cattle in 1951 and most of these would be in the prairie area. The existence of ranching within the prairie area raised the average number of cattle per farm in this area to a higher figure than was found on most farms.

Provincial averages for sizes of farms do not show the wide variations which exist. This is shown in a distribution of farms by size in Table 6. The distribution can be understood more clearly when it is recalled that the quarter section is the unit of land. Farms are, therefore, generally 160 acres in size or multiples thereof.

In Manitoba and Alberta, one-quarter section farms predominate. In Saskatchewan, the farms are somewhat larger with one-half section farms predominating. In the prairie area of Saskatchewan there are also a large proportion of three, four, five and six quarter section farms.

Such a range in size of farms and in other characteristics gives rise to a wide variation in income. Table 7 shows the distribution of farms according to total value of products sold. The year 1950 was a little above average with respect to yields and considerable above average with respect to prices. Even under these favorable conditions, a large number of farms in each area had very low total sales of between \$250 and \$1,200. The largest number of farms in each area had gross

Table 6.- Percentage Distribution of Farms According to Size, 1951.

| Province      | Number<br>of farms | Size in Acres         |               |               |               |                |                 |                | Total |
|---------------|--------------------|-----------------------|---------------|---------------|---------------|----------------|-----------------|----------------|-------|
|               |                    | Up to<br>239          | 240 to<br>399 | 400 to<br>559 | 560 to<br>759 | 760 to<br>1119 | 1120 to<br>1599 | 1600<br>& over |       |
|               |                    | - per cent of farms - |               |               |               |                |                 |                |       |
| Manitoba      | 52,383             | 40.1                  | 30.8          | 14.1          | 8.5           | 4.6            | 1.4             | 0.5            | 100.0 |
| Saskatchewan: |                    |                       |               |               |               |                |                 |                |       |
| Prairie area  | 51,089             | 9.2                   | 23.0          | 19.7          | 18.7          | 16.6           | 8.1             | 4.7            | 100.0 |
| Park area     | 60,929             | 27.8                  | 32.0          | 18.5          | 11.4          | 7.2            | 2.2             | 0.9            | 100.0 |
| Alberta       | 84,315             | 32.2                  | 29.1          | 14.3          | 9.1           | 7.6            | 3.9             | 3.8            | 100.0 |

Source: Census of Canada, Volume VI, Part II, 1951.



sales between \$1,200 and \$2,500 and considerable numbers had sales in excess of this amount.

### General Characteristics

The general characteristics of these farms then are the rather large acreages relative to sizes of farms elsewhere. Reliance is placed mainly on wheat for income with cattle providing an important secondary source. In spite of the large areas farmed, income is only moderate and on a large number of farms it is very low.

The economy of these provinces is chiefly agricultural. In Manitoba, 28.2 per cent of the people live on farms. In Saskatchewan and Alberta these percentages are 48.0 and 36.7 per cent, respectively. These are high compared with the national average of 20.8 per cent or with 15.3 per cent for Ontario, the nation's most industrialized province. Although the percentage of people living on farms is high, considerable reduction in this proportion has taken place over recent years. The reduction represents a shift in people out of agriculture and also a growth in population generally. The movement of people out of some agricultural areas is more significant than may at first be apparent. Not only has there been a reduction in numbers of farms but this reduction has taken place at the same time that additional farms are being established in new areas. In Manitoba in 1931, 36.6 per cent of the people lived on farms. In Saskatchewan, the corresponding figure was 61.2 per cent and in Alberta it was 51.3 per cent. These figures



Table 7.- Percentage Distribution of Farms According to Value of Products Sold, 1951.

| Province              | Number<br>of farms | Dollars      |                |                 |                 |                 |                 |                 |        | Total |
|-----------------------|--------------------|--------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------|-------|
|                       |                    | Under 250 \$ | 250 to<br>1199 | 1200 to<br>2499 | 2500 to<br>3749 | 3750 to<br>4999 | 5000 to<br>7499 | 7500 to<br>9999 | & over |       |
| - per cent of farms - |                    |              |                |                 |                 |                 |                 |                 |        |       |
| Manitoba              | 49,075             | 8.7          | 15.2           | 26.1            | 18.4            | 11.9            | 11.8            | 4.3             | 3.6    | 100.0 |
| Saskatchewan:         |                    |              |                |                 |                 |                 |                 |                 |        |       |
| Prairie area          | 49,260             | 4.2          | 14.8           | 29.3            | 20.0            | 11.7            | 11.7            | 4.3             | 4.0    | 100.0 |
| Park area             | 58,236             | 6.8          | 19.7           | 32.3            | 18.6            | 9.8             | 8.2             | 2.7             | 1.9    | 100.0 |
| Alberta               | 79,107             | 10.3         | 16.4           | 26.8            | 16.2            | 9.8             | 9.8             | 4.3             | 6.4    | 100.0 |

\* Part-time and institutional farms excluded.

Source: Census of Canada, Volume VI, Part II, 1951.

show the trend toward larger farms and also the provinces important reliance on agriculture. They also point to what may be restraining factors on adequate population and resource adjustment. Employment in other occupational pursuits is not as readily available as in more industrialized sections of the country.

The main feature of the year to year operation of these farms is uncertainty - uncertainty with respect to production and uncertainty with respect to price. The uncertainty of price is a problem faced by farmers everywhere and it is probably not much greater in the prairie provinces than elsewhere. The Federal Government has inaugurated policies which, to some extent, have removed some of the uncertainties from price fluctuations. The problem of production uncertainty, however, remains. It is a physical phenomenon due largely to weather conditions. Nothing can be done to remove the basic cause. Although production and conservation practices can be implemented which will to some extent reduce the seriousness of inadequate seasons of rainfall, there is little scope for even nearly adequate remedial measures in this way. Recognition of this fact implies that serious declines in income can be alleviated only by the provision of reserves. Such reserves must of necessity be substantial. Instabilities of this area are not characterized by good years alternating with poor years but by the "bunching" of good years and then poor years. That farmers themselves can not or do not provide adequate reserves for this purpose is evidenced by the financially bankrupt circumstances in which they have been found.

It is also shown by the large amounts of relief and assistance which it has been found necessary to provide from time to time. It would seem, then, that some form of crop insurance would provide the means by which farmers might build up reserves to carry them over the years of inadequate income.



#### IV. CONSIDERATIONS IN THE ESTABLISHMENT OF CROP INSURANCE

##### The Need for Insurance

Much has been written concerning the subject of crop insurance for the high risk areas in the Great Plains of the United States and Canada. On one thing there appears to be unanimous agreement, some kind of crop insurance is desirable and necessary. T.W. Schultz stated <sup>1/</sup>, "Some form of crop insurance should be provided for farming areas dependent upon crops for most of their income and wherever, by nature of the area, yields fluctuate widely." Black and Kiefer concluded that <sup>2/</sup> "No doubt the best way to handle the instability arising from crop failures is by means of insurance." D. Gale Johnson arrived at a similar conclusion <sup>3/</sup>: "Where yield uncertainty is important, an adequate solution can be found only in yield insurance." After a considerable amount of study at the North Dakota Agricultural College, Schickele said <sup>4/</sup> " ... expand and improve crop insurance ...". Studies in Canada have in general arrived at similar conclusions.

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<sup>1/</sup> Schultz, T.W., Agriculture in an Unstable Economy, McGraw-Hill Book Company, Inc., New York, 1945, p. 217.

<sup>2/</sup> Black, J.D. and M.E. Kiefer, Future Food and Agriculture Policy, McGraw-Hill Book Company, Inc., New York, 1948, p. 96.

<sup>3/</sup> Johnson, D. Gale, Forward Prices for Agriculture, The University of Chicago Press, Chicago, 1947, p. 232.

<sup>4/</sup> Schickele, R.W., Panel on Crop Insurance and Farm Income Stabilization, Towards Stability in the Great Plains Economy, The Agricultural Experiment Station, University of Nebraska, Lincoln, Bulletin 399, 1950, p. 71.

In a study of crop insurance in Saskatchewan, Hansen stated, <sup>5/</sup>  
 "The state ... must provide a method whereby the individual may  
 secure a measure of security against total or partial crop failure,  
 due to causes beyond individual control ..." A Committee on Crop  
 Insurance in Saskatchewan stated that <sup>6/</sup> " ... the problem of crop  
 insurance merits the careful attention of all those who are interested  
 in a stable agriculture."

In Manitoba, the Committee on Crop Insurance recommended, <sup>7/</sup>  
 "From the standpoint of the farmer, municipal and provincial govern-  
 ments, and all industries dependent on a stabilized and prosperous  
 agriculture, we are satisfied that a system of crop insurance is  
 highly desirable for Manitoba. We are convinced ... that a crop  
 insurance scheme is practicable for this province." A somewhat  
 different view is presented by Motherwell in a study of crop  
 insurance in Saskatchewan. He says <sup>8/</sup> "After reflection on the  
 American experience, especially regarding the operation of the  
 scheme in high risk areas, bearing in mind the amount of partici-  
 pation over the country generally and the inability of many districts  
 to pay premiums, and after recalling the yield experience of southern

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<sup>5/</sup> Hansen, W.J., Crop Insurance, Economics Division, Canada  
 Department of Agriculture, progress report, unpublished manuscript,  
 1937, p. 90.

<sup>6/</sup> Preliminary Report of Committee on Crop Insurance,  
 Saskatchewan Department of Agriculture, Regina, 1936, pp. 1-2.

<sup>7/</sup> Crop Insurance in Manitoba, Report of the Manitoba Crop  
 Insurance Committee, Manitoba Economic Survey Board, Winnipeg,  
 1940, p. 10.

<sup>8/</sup> Motherwell, R.E., A Study of Crop Insurance, Report of the  
 Saskatchewan Reconstruction Council, Appendix 3, Regina, 1944, p.40.

Saskatchewan, one is forced to conclude that Crop Insurance for this province is possible but its practicability is much to be doubted". In this reference to crop insurance, Motherwell had in mind a program in which farmers would be required to carry the full load for a coverage of 60 or 75 per cent of average yield. He did support the principle on the basis of a contributory scheme for a smaller coverage. <sup>9/</sup> In addition, various farm organizations have signified their support of crop insurance in principle.

Such widespread and generally unqualified support of the principle of crop insurance in the high risk area of the Great Plains indicates the existence of convincing reasons for that support. The reasons are both social and economic in nature.

Welfare Considerations. Probably the main reason why crop insurance is considered necessary is because of the extreme hardships experienced by farm families and of those whose incomes are intimately affected by those farmers in a year or succession of crop failure years. The hardships experienced are serious enough so that society in general has accepted the moral obligation to assist by way of relief, if necessary. If crop insurance will help to lessen the impact of crop failures on the families concerned then this in itself would constitute sufficient grounds for its institution.

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<sup>9/</sup> Motherwell, R.E., Ibid., p. 67.

Economic Considerations. In addition to the desirability for crop insurance from the aspect of welfare there are a number of significant economic advantages to be derived from a program of crop insurance. These advantages exist mainly in the sphere of greater efficiency in the use of resources. A basic assumption of most production economic theories is that the maximizing of income is the motivating force of economic activity. The maximizing of returns, on the part of individuals, the theory goes, involves obtaining the most efficient use of resources.

Discerning students who have studied the economy in the high risk area of the Great Plains maintain, however, that maximizing income is not the only goal and probably not the main goal.<sup>10/</sup> Rather, the prime objective is safety. Farmers first of all seek to insure that they are able to overcome extremely unfavorable contingencies rather than to maximize a long run level of net farm income. It is only within the framework of a production program designed primarily to provide for survival that the goal of high income is given expression.

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<sup>10/</sup> See Kelso, M.M., Knowledge for What in the Northern Great Plains, Journal of Farm Economics, Volume XXXII, No. 3, (August 1950), p. 354. Schickele, R., Farmers Adaptations to Income Uncertainty, Journal of Farm Economics, Volume XXXII, No. 3, (August 1950), pp.356-374. Barber, Lloyd E., and Philip J. Thair, Institutional Methods of Meeting Weather Uncertainty in the Great Plains, Journal of Farm Economics, Volume XXXII, No. 3, (August 1950), pp. 394-396. Johnson, D. Gale, op. cit., Chapter 4, and Heady, Earl O., Economics of Agricultural Production and Resource Use, Prentice-Hall, Inc., New York, 1952, Chapter 17.

The uncertainty of weather, and consequently of yields gives rise to inefficient use of resources in various ways. Because of this uncertainty, farmers do not know how much the production will be until it is realized. A knowledge of the relation between physical output and input is required in order to plan the most efficient use of resources. Since this relationship is unknown (output being determined more by weather than by the nature and amount of physical input) production plans must be based on probability expectations. The expectations may be based on some concept of average yields or they may be weighted by the experience over recent years, the most recent possibly being given the most weight. In any event, results will differ widely, in many cases, from the expectations on which the production program was based. In a very favorable year, a production program based on expectations of average yields would not provide as efficient use of resources as one based on expectations of high yields. Inefficient use of resources occurs whenever production plans are based on expectations which are different than the actual output obtained. Examples of decisions with respect to which a reasonably accurate prediction of output is necessary in order to allow near optimum resource use are: the acreages to be seeded to various crops, the acreage to be left in summerfallow, the amount of fertilizer to be applied and the numbers of various kinds of livestock to be kept.

The second group of factors which do not allow maximum resource efficiency and which arise out of the uncertainty of weather are those which the farmer himself imposes in order to avert drastic declines in income. They are the means to his first objective of safety and survival, and involve the sacrifice of what would be optimum resource allocation if his goal were maximum returns. Probably the most common method by which a farmer hopes to provide some measure of safety is by diversifying his enterprises. Diversification of enterprises allows diversification both with respect to inputs and products. Diversification of inputs allows flexibility in that non-cash items may be substituted to a greater degree than in cases where production is concentrated in a single enterprise. The incorporation of a livestock enterprise, for example, into the farm business allows a more even and fuller utilization of labor throughout the year and because of the increased acreage in grass it reduces seasonal peak labor requirements associated with a single crop enterprise.

Farmers diversify in products produced so that if one product fails the other may provide sufficient income to avert the serious consequences that would result in the event of the failure of the single product. Variation in the sum of several products, each having equal variation, is less than the variation in a single product unless the variation in the several products is perfectly correlated. Recognition of this fact has led many farmers to the practice of diversification. In addition to the "well planned"



diversification, that diversification which provides maximum safety, and this in itself may lead to less than maximum efficiency of resources, there is a certain amount of diversification per se. This kind of diversification would lead to an even more inefficient use of resources than the former. An example of diversification would be the growing of different kinds of crops. Different crops such wheat, oats, barley and flax are dependent largely on weather for satisfactory yields. Unfavorable weather affects each crop in much the same way. To the extent that yields of these crops are affected in the same way, diversification not only does not add stability but represents, in many cases, malallocation of resources.

Probably the most common example of diversification is the maintenance on farms of small herds of livestock and small flocks of poultry. In most cases, these enterprises would not be considered efficient by any standard. Absence of the fear of drastically reduced crop yields would allow disposition of the inefficient enterprises. The above observations concerning diversification are not made without recognition of the fact that on certain kinds of farms diversification allows complementary and supplementary relationships between enterprises and thus provides the most economic uses of available resources. Diversification of this type, however, is more adaptable in areas characterized by more stable and predictable weather conditions and where returns from alternative crops and enterprises are likely to be more nearly equal.

An additional kind of diversification on some farms is in the maintenance of a relatively high degree of liquidity. This is known as internal capital rationing. More assets are kept in a liquid form for contingencies than would be necessary in an area characterized by more stable weather conditions. Such assets may be kept in the form of idle cash, bonds or in stockpiles of food. In any case, the assets earn less than they would if they were invested in more productive goods such as machinery, livestock or land. It is likely, however, that this form of diversification does not constitute an important one for most farms. Schultz<sup>11/</sup> indicated that it would require about \$25,000 in financial assets, or \$100,000 in total assets, by the farm family on optimum sized farms in the northern plains states to "survive" a series of lean crops of the kind that occurred in the thirties. He observed that <sup>12/</sup>"It is hard to believe that a typical farm family can command so large a collection of resources under existing conditions".

A further step taken by farmers to avert repayment commitments on debt is the substitution of labor for capital. Although the marginal return to capital would in the long run be greater than its marginal cost, farmers prefer to substitute labor. Then in a year of

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<sup>11/</sup> Schultz, T.W., The Economic Organization of Agriculture, McGraw-Hill Book Company, Inc., New York, 1953, p. 333.

<sup>12/</sup> Ibid., p. 333.

crop failure they would not be faced with payments on debt. The existence of uncertainty tends to promote the use of excessive amounts of labor and the use of too little capital for maximum efficiency.

Both hired labor and family labor are different than capital. The expenses associated with hired labor can be disposed of quickly. Family labor is the residual claimant on income and the share going to family labor can be reduced to the point of providing only bare essentials. Debt commitments, on the other hand, require a fixed payment each year.

The main reason why farmers resort to these safety measures is because they are not able to borrow in periods of low income. If capital were available there would be no reason why they should not borrow in periods of crop failure and at the same time concentrate on obtaining maximum long run returns. The absence of available capital presents the third way in which weather uncertainty, and the consequent insecurity of the farm family, prevents the optimum resource allocation. It is commonly referred to as an external or involuntary capital rationing.

In contrast to the actions taken by farmers to avert drastically low incomes, this phenomenon refers to activity taken by lenders in the face of uncertainty in order to avoid serious losses in years of crop failure. Lenders are not willing to lend money to farmers at the going rate of interest even though in the long run the capital

investment made by the farmer would provide a return in excess of the interest rate. The impact of capital rationing on resource allocation is similar to the effects of actions taken by farmers to avert the burden imposed by debt. Because of the inability to borrow for the purchase of machines, farmers must substitute labor to a greater extent than comparative returns from investments in labor and capital would justify. Also, where mechanization would allow operation of larger units, the under-employment of machines due to capital rationing would again represent less than optimum use of resources. Capital rationing also prevents farmers from purchasing additional land even though the returns would more than pay interest costs.<sup>13/</sup>

Three general effects of uncertainty on resource allocation have been discussed. The first indicated the inability of an entrepreneur to allocate his resources in an optimum manner if he did not know what his yields or products would be. The second and third factors dealt with measures taken by farmers and by lenders to provide a greater element of safety in the face of uncertainty. The measures were taken to eliminate the extremely low incomes rather than to maximize income. They resulted in a misallocation of

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<sup>13/</sup> For more detail on effects of uncertainty on resource allocation see Johnson, D. Gale, op cit, Chapters IV and V, and Ready, Earl O., op cit, Chapter 15.

resources not only within agriculture but also with respect to labor and capital, between agriculture and other segments of the economy. If a program of crop insurance would provide the necessary security in those years when farm income is very low then it would at the same time remove the motive for misdirecting resources from those uses which provide maximum returns to those which provide for a greater element of safety.

Other Considerations. In addition to hardship imposed on farm families and uneconomic adjustments with respect to resource use, the instability caused by crop failures results in further costs to society. Each of these would be ameliorated by effective crop insurance. A crop failure, and especially a series of crop failures, results in an abnormal number of foreclosures. The foreclosures resulting from crop failures involves a loss to the farmer, the community and often to the lender himself. Apart from the hardships and the readily apparent costs of processing foreclosures there is also an economic cost involved in replacing one farmer with another.

The economic position of a large segment of the economy also has an effect on the general economic health of the nation. Farmers with purchasing power provide employment for people in other segments of the economy and in years of crop failure this impetus to economic activity is lacking. Although this aspect of cost is often over-emphasized it is nevertheless true that farmers of the plains area constitute an important element in the national economy

and that widespread failures have the effect of lowering general economic activity.

Another important cost to society of widespread crop failure is the relief that must be supplied.<sup>14/</sup> Chapter I indicated the major relief activities of various governments during the 1930's to allay the distressing effects of crop failure and depression. Crop insurance would provide the means of reducing or eliminating these costs to society and to the farmers concerned.

#### Other Stabilizing Factors

Although high priority is given to crop insurance as a means of alleviating many of the difficulties imposed by crop failures, it is recognized at the same time that crop insurance itself is not a cure-all. Farmers and governments must be prepared to take other steps in this regard as well. Schultz<sup>15/</sup> groups the organizational improvements into two categories: those to reduce yield instability and those to adjust to instability. He holds little hope for much to be accomplished by way of eliminating existing instability in yields. Among things that can be done are:

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<sup>14/</sup> For a discussion of these costs see Thair, Philip J., Stabilizing Farm Income Against Crop Yield Fluctuations, Agricultural Experiment Station, North Dakota Agricultural College, Fargo, North Dakota in cooperation with Bureau of Agricultural Economics, Bulletin No. 362, 1950, pp. 10-11.

<sup>15/</sup> Schultz, T.W., The Economic Organization of Agriculture, pp. 327-334.



1. Close out areas that are particularly vulnerable to crop failure. The purchase of submarginal areas by public agencies would be part of the program.

2. Adapt new and better technology. This would include use of drought-resistant crops, dryland farming, disease-resistant plants and animals and modern insecticides.

3. Apply water where feasible. The extent to which irrigation could be used in the overall picture, however, is limited.

In the group of improvements that might be made by way of adjustment to instability Schultz lists the following:

1. Embed the costs of yield instability into the value of the land.<sup>16/</sup>

2. Develop firms that specialize in carrying particular risks.

a) Develop firms specializing in yield insurance;

b) Landlords have assumed and could be further encouraged to assume risks by buying land and renting to operators. The community preference

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<sup>16/</sup> Schultz makes much of this point. See also Schultz, T.W., Agriculture in an Unstable Economy. p. 217, and Schultz, T.W., The Great Plains Quest for Stability, Towards Stability in the Great Plains Economy. p. 96. In spite of the emphasis on this point, the proposal would be difficult to implement. Even if it were possible, all it would do is to reduce repayment commitments on the land where farmers were in debt. Other than this saving, it would not, of course, provide the family with any money with which to carry them through the crop failure years.

for family farms and the increasing importance of machinery and equipment would limit possible results along this line;

- c) Develop farms with sufficient assets to carry them through difficult years. The amount of assets required, however, is generally too large for the family to accumulate.

In a North Dakota study,<sup>17/</sup> Thair indicated that crop insurance by itself did not provide sufficient stability to prevent income from dropping below defined levels. It did, however, contribute much toward stability, and insurance together with one or more of emergency credit, grain storage and cash reserves could achieve the desired objectives.

Crop insurance must, therefore, be examined with the recognition that although it is an important device and probably the most important device by which some measure of stability may be introduced in high risk areas, it cannot provide all of the stability desired. Other measures must also receive consideration. It is not the purpose of this study, however, to appraise them. Since this study is concerned with the insurance aspects of stabilization it was considered desirable to make explicit recognition of the supplementary methods of stabilization.

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<sup>17/</sup> Thair, Philip J., op.cit.

It is evident that there is nearly unanimous agreement that some form of crop insurance should form part of the stabilization program for the high risk areas of the Great Plains. Naturally, some contrary views arise when details of a particular plan are discussed. It is also abundantly clear that economic and welfare considerations make the implementation of some form of crop insurance highly desirable. There is evidence, too, that there is much general agreement as to the requirements of a conceptual or theoretical model of a crop insurance program. Practical realities, however, point to incompatibilities within the requisites of what might be considered a model program. It would seem rather pointless then to dwell too long on the refinement and presentation of the conceptual model when practical difficulties prevent the implementation of such a program. A more fruitful approach is considered to be that of first outlining the desirable characteristics of a crop insurance program and then giving consideration to practical inconsistencies within that model, placing some priority on those characteristics, and finally arriving at a program which has as many of the desirable characteristics as possible and which, at the same time, takes sufficient cognizance of practical realities so as to make the program possible of implementation. The balance of this chapter is directed toward that end.

### Some Features of a Theoretical Model of Crop Insurance

The general features of an "ideal" crop insurance program are summarized below and considered later in more detail.

1. Participation should be voluntary. This is based on the principle that individuals should be allowed as much freedom as possible.

2. The program should have as wide a coverage every year as possible. Only in this way can insurance principles be employed.

3. The program should not subsidize inefficient farmers since this represents a direct cost in the form of payment to those farmers but also an indirect cost in the form of misallocated resources. In the long run, then, premium payments on each farm should equal benefits derived.

4. The plan should be self-supporting, except possibly for administrative expenses, since sufficient precedence exists for considering the administrative costs as a part of general administration. A continual and substantial subsidy to one segment of economy involves a misallocation of resources and, therefore, a cost to the general economy. It also involves an interference with distribution of income which raises questions of "justice" between the groups involved.

5. The program should provide an adequate degree of stability to the families' level of living.

6. Administrative costs should not be too high.

7. The above points imply a further desirable feature which should probably be made explicit. That is, the program should not involve costs in the form of misallocated resources.

### Practical Considerations

If it were possible to implement a program having the above characteristics, the problem of crop insurance would be solved. In reality, however, there are incompatibilities within the above and other obstacles to its use as a framework for a crop insurance program. It is in deciding which of the above features to retain and which of them to alter or sacrifice altogether, that difficulties and disagreements arise.

The first two points may be taken together since they are closely related and appear to be incompatible. It must first be recognized that yield variability is so great in the high risk areas of the Great Plains that premium rates are necessarily high. Heisig indicated <sup>18/</sup> that in some areas, the annual premium rates were as high as 40 or 50 per cent of the guaranteed yield on a 75 per cent basis. This was in the United States under the Federal Crop Insurance program. He added further that "it is representative of the rates in large areas of the Great Plains".<sup>19/</sup> When confronted with

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<sup>18/</sup> Heisig, Carl P., Income Stability in High Risk Farming Areas, Journal of Farm Economics, Vol. XXVIII, No. 4, (November 1946), p. 968.

<sup>19/</sup> Loc. cit.

rates that high or nearly that high, many farmers would not consider themselves to be in a position to take part in the program. Thair has shown that in North Dakota, participation has been lowest in areas of highest risk and highest in areas of lowest risk.<sup>20/</sup> Many who have studied the question have attributed the failure of the Federal Crop Insurance program in the high risk areas of the United States in a large part to the low participation that has been obtained.<sup>21/</sup> Halcrow, however, preferred a voluntary contract because of "social-political" reasons. Black and Kiefer expressed a contrary view. They concluded that <sup>22/</sup> "systems of compulsory insurance may prove to be necessary in the end".

In western Canada, the Prairie Farm Assistance Act has been in operation since 1939 and rarely if ever has the compulsory feature of the one per cent levy been criticized. The fact that substantial subsidies are involved is no doubt partly the reason for the absence of criticisms in this respect but even in Manitoba, the only province where premiums exceeded benefits over the period involved, the compulsory feature of the levy is not criticized. Rather, criticism

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<sup>20/</sup> Thair, Philip J., op.cit. p. 19.

<sup>21/</sup> Thair, Philip J., Ibid, p. 19. Halcrow, Harold G., Actuarial Structures for Crop Insurance, Journal of Farm Economics, Vol. XXXI, No. 3, (August 1949), p. 419, and Schultz, T.W., The Economic Organization of Agriculture, p. 334.

<sup>22/</sup> Black, John D. and Kiefer, Maxine E., op. cit. p. 334.



is directed mainly toward the actuarial structure. <sup>23/</sup>

A further pertinent point to this question is that the economy as a whole stands ready, as they have in the past, to assist farmers or any other group who experience emergency. Because of its readiness to do this the nation may be justified in expecting that farmers make some effort on their own behalf through means of a form of crop insurance to meet these likely contingencies.

A lucid presentation of how choices are made rationally between conflicting values is given by Hathaway.<sup>24/</sup> Freedom to participate or not to participate in a crop insurance program conflicts with another desired goal, that of security. The attainment of maximum satisfaction involves choice. In this case, the freedom of being allowed to decide whether or not to participate may be of less value to farmers as a group than the value of increased security and stability. The marginal cost involves the loss of some freedom and the marginal return is increased security. If the former is less than the latter, the rational choice is clear. Since high participation in a program is necessary, since it is not likely to be obtained in a voluntary scheme and since the farmers of western Canada apparently consider the loss of this freedom as being of lesser value than the value of security obtained a compulsory system is preferred.

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<sup>23/</sup> See The Financial Post, Toronto, December 26, 1953.

<sup>24/</sup> Hathaway, Dale E., Agricultural Policy and Farmers' Freedom: A Suggested Framework. Journal of Farm Economics, Vol. XXXV, No. 4, (November 1953), pp. 496-503.

The third point, that having to do with the establishment of actuarial rates for individual farms involves problems of a different kind. The first of these relates to the difficulty of establishing actuarial rates. The second problem is that of determining the most effective way of applying the rates which have been established. With respect to the first of these questions, a considerable amount of research work has been done. One of the major conclusions of this research has been that more of such work is necessary. Numerous studies have indicated that there appears to be no systematic pattern of yields and that the weather factor is "... an uncertainty of a kind that seems to preclude actuarial determination of annual budgetable costs of weather risks".<sup>25/</sup> In studies of tree-ring growth, one covering 534 years and another covering 152 years, it was concluded to be impossible to work out a definite pattern of yields.<sup>26/</sup> Because of unpredictability of weather and for other reasons, Schultz stated that there has been too much stress on placing crop insurance on a wholly self-supporting basis.<sup>27/</sup>

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<sup>25/</sup> Schickele, R., Farm Business Survival under Extreme Weather Risks, Journal of Farm Economics, Vol. XXXI, No. 4, Part 2, (November 1949), p. 931.

<sup>26/</sup> Halcrow, Harold G., Problem of Farm Business Survival - A discussion, Journal of Farm Economics, Vol. XXXI, Part 2, (November 1949), p. 951.

<sup>27/</sup> Schultz, T.W., Agriculture in an Unstable Economy, p.218.

The unpredictability of weather means that premiums equal to benefits can be established only by chance. It is obvious then that in some periods, subsidies would be involved and that actuarial structures aimed at equalizing premiums and benefits over time must be based on approximations.

The second question, that of determining how the premium and benefit rates should be applied, is resolved into whether individual actuarial rates should be established or whether premium and benefit rates should be established for areas. Ideally, benefits should equal premiums for each farm in the long run. Two difficulties arise. Individual premium-benefit rates allow the inefficient farmer to obtain benefits for poor management as well as for natural hazards. Secondly, premium rates are difficult to obtain for individual farms. The Federal Crop Insurance Corporation sold insurance on the basis of individual rates for a few years but decided it was not practical because of inaccurate or inadequate data and by 1946 nearly all insurance was sold under uniform county-wide premium rates. At present the premium rates under the Federal Crop Insurance program are established on an area basis and benefits are determined on the basis of individual yields. In order to prevent individuals benefiting because of mismanagement rather than adverse conditions, restrictions are placed on who may participate. Individuals with poor risk records are not allowed to participate in the program.

A plan in which both the premium rate and benefits are determined on an area basis has the advantage that the farmer using sound management practices with consequent increases in yields would not be penalized because of his practices. A farmer with declining yields because of mismanagement also would not receive windfalls since the average yield for the area would be such that the area would not qualify. The acceptability of area insurance would depend largely then on the extent to which homogeneous areas could be delineated. In order that the program is equitable between farms, the areas would have to be homogeneous with respect to susceptibility to crop failure.

In a comprehensive study Halcrow found that an insurance program based on individual premium and benefit rates was adaptable chiefly for low risk areas. He also found that area yield insurance was the most appropriate for high risk crop regions of the Great Plains and, therefore, recommended studies to delineate areas and to calculate premium-benefit schedules for these areas.<sup>28/</sup>

Barber and Thair arrived at similar conclusions: They said:<sup>29/</sup>

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<sup>28/</sup> Halcrow, Harold G., Actuarial Structures for Crop Insurance, p. 441. See also Halcrow, Harold G., Panel on Crop Insurance and Farm Income Stabilization, Towards Stability in the Great Plains Economy, p. 74.

<sup>29/</sup> Barber, Lloyd E., and Philip J. Thair, op. cit., pp. 398-399.

Under each of the several insurance plans that have been used, indemnity payments have been determined separately in terms of the yield experience of each insurable unit. This method inherently has the effect, at each coverage and rate level, of attracting participation from farmers whose yield probabilities are poorer than average while discouraging participation from farmers who have better than average probabilities of attaining the insured yield level ...

As an alternative method it is suggested that indemnities be determined upon the basis of average yields over relatively homogeneous areas. Such a revision would remove the basis for adverse selectivity, as the yield prospects on a particular farm would have no influence on whether an indemnity is received ...

It is conceivable that in many cases the fluctuations in individual farm yields would run counter to the fluctuations in the area mean yield. The stabilizing effects of such a program would depend in a large degree upon the extent to which areas could be delineated, throughout which the correlation between individual farm yields and the area mean yield is high. This is a matter that must be determined empirically.

The fourth point in the list of characteristics in the "ideal" insurance program was that it should be self-supporting. The reasons for this were that continual subsidies to a segment of the economy would tend to place or maintain resources there which could not be economically justified and that subsidies would involve a disturbance in the distribution of income. Reference has already been made to the impossibility of accurately determining actuarial rates over time and that subsidies in certain periods must occur. These would at least partly be balanced by surpluses of premiums in other periods.

There is a valid argument for the allowance of some subsidy from other standpoints. From the standpoint of alternative costs, the cost of a crop insurance program involving some subsidy is likely to be

considerably cheaper to society in general than costs in the form of relief and assistance which would be forthcoming from society in the absence of that program. In view of the stand taken on compulsory insurance, and in view of the very high costs of insurance in some areas, some subsidies may be necessary in the initial phase of an insurance program. Public policy is formulated in a political economy and for this reason it is necessary that the program has the support of the people concerned. No program would have the least possible chance of being implemented which suddenly and forcefully imposed premium rates of 30, 40, or 50 per cent of the average yield. The establishment of premium rates considerably below these levels would still bring about some desired adjustments in resource use and at the same time it would not jeopardize the possibilities of implementing the program. The establishment of premium rates below the actuarial rate would involve some subsidy at least in the initial stages, but it may represent a not too costly method of "purchasing" desirable economic adjustments in the use of agricultural resources.

The fifth point dealt with the provision of an adequate degree of stability. The term "adequate" provides only a subjective basis of appraisal. It is difficult to indicate what would be an adequate level of income. Ideally, it should cover necessary cash farm expenses and necessary living expenses. Necessary cash farm expenses can be determined within reasonable limits in an objective manner

but evaluations of what constitutes necessary living expenses are again highly subjective. It is probably necessary to consider them in the light of actual need, the degree to which the program is self-supporting and the degree to which economic and population adjustments have been made in relation to resources available. In an entirely self-supporting program the "critical level" of living might well be established as the average over a period of years. In a program involving some subsidy it would justifiably be expected that the income necessary for living expenses should be somewhat below the average level of income in the area. Also, in a type of agriculture where there are misallocated resources, including over-population, the allowance for living expenses should be somewhat below the average so as to provide some incentive for bringing about the desirable adjustments. The least that a program should provide is an amount which would cover the basic requirements of food, shelter and clothing.

The sixth point relates to administrative costs. It is possible to conceive of refinements which would entail an extensive and expensive administration. Possible advantages of changes in the insurance program must be weighed against the additional administrative costs which they may involve. Compulsory insurance for which premiums and indemnities are determined on the basis of area yields would be much simpler and cheaper to administer than insurance based on individual rates of premiums and indemnities. Administrative



costs of the Federal Crop Insurance in the United States in 1939 and 1940 were \$26.44 and \$15.14 per contract, respectively.<sup>30/</sup> Administrative costs of the Prairie Farm Assistance Act in western Canada have been less than two dollars per farm. Assistance under this Act, however, was entirely different in nature to insurance provided under Federal Crop Insurance in the United States so that the costs are not comparable. The figures do, however, set what might be considered practical limits to the administrative costs of an insurance program.

The final point, that having to do with the effects of a crop insurance program on resource allocation has already been mentioned. The point already made was that it would be politically impossible, within the framework of our democratic institutions, to forcefully and suddenly impose premiums equal to indemnities. For this reason and for the welfare consideration of what such a cost would imply, it would be necessary to have premiums somewhat less than indemnities in some areas. This would mean that there would be a tendency toward less than optimum resource allocation. The imposition of a higher premium than that at present existing would mean, however, that it would provide desirable adjustment toward the goal of optimum resource allocation.

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<sup>30/</sup> McCarty, Dale E., Wheat Yield Insurance, Journal of Farm Economics, Volume XXIII, No. 3, (August 1941), p. 667.

### Characteristics of Practical Model of Crop Insurance

The "ideal" program of crop insurance has undergone many alterations to bring it within the realm of practical reality. In summary, the revised model program would appear as follows:

1. In order to obtain as wide a coverage as possible and for other reasons indicated above, the insurance program should be compulsory.
2. Premium and indemnity rates should approach actuarial conditions in the long run but some subsidies for certain periods are not considered too serious a fault. Premium and indemnity rates between farms, however, should bear as close a relationship as possible to relative risks involved.
3. Highly subsidized programs should be avoided because they misallocate resources, disturb income distribution and exist in what may be an insecure position due to the possibility of funds suddenly disappearing.
4. The program should provide sufficient stability so that the farm family has at least the basic essentials of food, shelter and clothing.
5. The program should be of such a nature that it is easy and inexpensive to administer.
6. The program should represent at least a step toward desirable goals. The fact that a program is not the means to the final goal is not sufficient grounds for its rejection.

It is considered that a crop insurance program meeting these qualifications is one which is possible to implement and at the same time has maintained the maximum desirable features possible. It is also considered that in spite of the sacrifice of some of the desirable features of the model that the "remains" represent a worthwhile program. The succeeding chapters are directed toward an appraisal of the extent to which the program of the Prairie Farm Assistance Act meets or might be altered to meet these qualifications.

## V. INCIDENCE OF COSTS AND BENEFITS OF THE PROGRAM UNDER THE PRAIRIE FARM ASSISTANCE ACT

The Act under which the Prairie Farm Assistance program operates is officially called "An Act to Assist Agriculture in the Prairie Provinces". Nowhere in the Act or in the regulations under which the Act is administered is reference made to the word insurance. There may be some question then as to the appropriateness of determining whether or not the program observes insurance principles. This question is largely resolved, however, since both assistance and insurance functions are provided. Furthermore, these two functions can be separated. Each has different objectives. The assistance function is based largely on welfare considerations while the insurance function is based largely on economic considerations. Since the program performs insurance functions, these functions can appropriately be examined to see the extent to which they follow insurance principles.

### General Principles of Insurance

Insurance generally is based on the principle that the premiums which the insured contribute equal the indemnities plus costs of administration. <sup>1/</sup> There are involved, however, different risks for different individuals. Classes of risks are, therefore, established.

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<sup>1/</sup> In schemes involving governments and welfare there are many precedents for the government to assume administrative costs.

Individuals having approximately the same risk are placed in a risk class and each one in the class pays the same premium. In life insurance, classes are based mainly on the age of the insured. In fire insurance, the type of structure, location and proximity to other buildings determine to a large extent the risk class and premium rate which applies.

The classes of risk which are established are rather broad and there are differences involved in the risk of individuals within those classes. The differences between classes, however, is much greater than that within classes and, therefore, there is a closer relation between risks and premium rates for individuals than would be possible without the classification. Even in life and fire insurance where losses for various classes can be predicted with a great deal of accuracy, there is no attempt to appraise and establish individual premium rates. Rather, individuals having similar risks are placed in classes and the rates established for those classes apply to all individuals within them, regardless of minor differences in risk for individuals within each class.

These then are the commonly accepted principles of insurance: that the insured are placed in classes for which risks and premiums are the same; that admittedly there are minor "injustices" within those classes, and that indemnities plus administration costs (with reservation of above) are equal to premiums. The purpose of this

chapter is to examine the program of the Prairie Farm Assistance Act in order to determine the extent to which these principles apply.

#### An Index of Payments

Much of the available data on the program of the Prairie Farm Assistance Act were on the basis of townships. With respect to benefits, information on benefits in dollars and on numbers of times that townships have received benefits was available. For comparative purposes, these measures of benefits have limitations. Comparisons of benefits in dollars between townships do not take into account differences in numbers of farms, differences in cultivated acreage per township and the fact that in some years only a part of some townships received benefits. Therefore, it would be possible for two townships to have received the same dollar benefits over a period of years and because one township consisted of more farms and more cultivated land the rate of benefit to this township would have been much lower. The use of the figure "number of times benefits received" also has limitations for comparative purposes. This figure did not make any distinction for categories of benefits or for payments to parts of townships. If part of a township had received benefits, then the township as a whole is counted as having received benefits. The number of times that townships have received benefits, therefore, does not serve as an adequate indicator, for comparative purposes, of the relative benefits obtained.

It was considered desirable to establish an index of payments which would show the relative rates of payments to the various townships. This index took into consideration both number of times that townships received payments and the categories in which they were paid. At the same time it recognized that only parts of townships were sometimes paid. This index is defined as the per cent of maximum possible per acre payments to a township. During the period under consideration, 1939 to 1949 inclusive, payments were made in ten of these years. No payments were made for the 1942 crop year. The maximum per acre payment that any township could receive in those ten years was \$25.00 (10 times \$2.50 per acre). In order to convert this to an index figure of 100, it was multiplied by 4. Thus, calculation of this index of payment for each township involved determining the per acre payments for the ten years involved. Payments made in the 0-4 bushel category were \$2.50 per acre and in the 4-8 bushel category were \$1.50. During the early years of the program there were also categories of 0-5 and 5-8 bushels per acre. From 1939 to 1941, payments were also made in the third category, 8-12 bushels per acre, because the price of wheat was below eighty cents per bushel.

A further distinction was also necessary. Payments were often made to only parts of townships. Up to 1949, this "part township" could be as small as one-quarter (9 sections) of the township or as large as three quarters (27 sections) of the township. For 1949 the size of the area could be between one-sixth and five-sixths of the



area of the township. For the purpose of calculating the index of payments, payments to parts of townships were considered as being one-half of that paid to full townships. The following is the basis on which per acre payments to townships were calculated.

| <u>Payments to full townships:</u><br><u>Category (bushels per acre)</u> | <u>Per acre payment</u><br><u>(dollars)</u> |
|--------------------------------------------------------------------------|---------------------------------------------|
| 0- 4 or 0- 5                                                             | 2.50                                        |
| 4.1- 8 or 5.1-8                                                          | 1.50                                        |
| 8.1-12 in 1939                                                           | 1.00                                        |
| 8.1-12 in 1940                                                           | 0.90                                        |
| 8.1-12 in 1941                                                           | 0.70                                        |

**Payments to part townships:**

|                 |       |
|-----------------|-------|
| 0- 4 or 0- 5    | 1.25  |
| 4.1- 8 or 5.1-8 | 0.75  |
| 8.1-12 in 1939  | 0.50  |
| 8.1-12 in 1940  | 0.45  |
| 8.1-12 in 1941  | 0.35. |

The per acre payments for the ten year period to each of the townships having received benefits under the Act were calculated in this way and then multiplied by 4 to convert them to the index. The index, then, represents the per cent of the maximum possible payment. The indexes of payments for the townships in the Prairie Provinces are shown in Figures III, IV and V. For purposes of illustration the indexes have been placed into five categories: 1-5, 6-24, 25-43, 44-60 and 61-100. The first category excludes any township which received full payment. The last category includes only those townships which received payments seven or more times out of ten. Most of them (264 out of 288) received payment eight or more years out of the ten.

Figure III

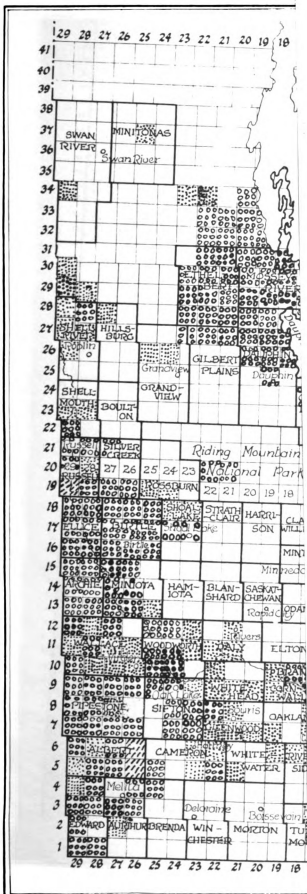


Figure IV

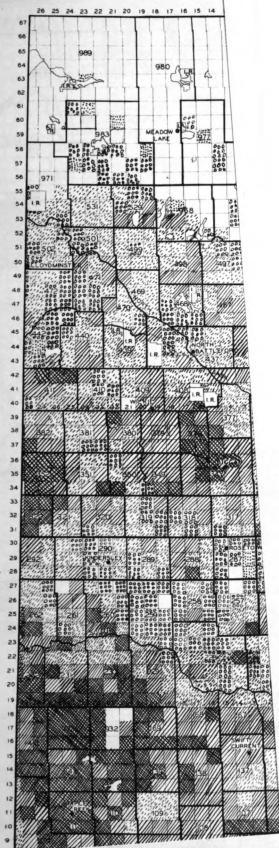
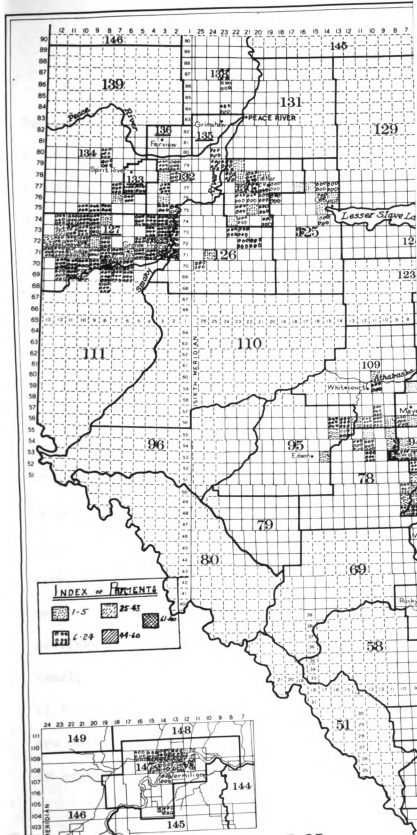


Figure V

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The index of payments maps indicate that large payments have been made in some areas while other areas have been paid nothing or very little. When it is considered that the one per cent levy applies over the whole area, it is readily apparent that there is little relation between the amount collected by the levy and the amount paid in benefits for the various groups of farms. This becomes even more apparent when average yields are taken into consideration. The average yield is higher in areas receiving no or little benefits so that the levy in dollar amounts is higher for these areas than they are for areas receiving large benefits.

Figures III, IV and V show the distribution of townships in broad classes by index of payments. A more detailed breakdown of this distribution is provided in Table 8. This table shows that the largest single category of townships is that which has received only one payment or that which has the lowest index of payment. There were, however, a large number of townships which received high payments. Nearly one-third of the townships (1,575 out of 4,968) received some payment in five or more years in the ten year period. Nearly one-fifth (915 out of 4,968) received more than 50 per cent of the maximum possible benefits during this ten year period. These are high rates of benefits and they give some indication of the levy or premium rates required to put the program on an actuarial basis.

[illegible][illegible]

Figure 1 displays the effect of the 2014-2015 season on the incidence of dengue fever in the 10 states of Brazil. The figure consists of 10 subplots, one for each state: Acre, Amapá, Amazonas, Bahia, Ceará, Espírito Santo, Goiás, Maranhão, Mato Grosso do Sul, and Pará. Each subplot shows the incidence of dengue fever from 2007 to 2015. The x-axis represents the year, and the y-axis represents the incidence rate. A vertical line at 2014 indicates the start of the 2014-2015 season. The incidence rate generally increases over time, with a significant peak in 2015 across all states.

Detailed description of Figure 6: This is a scatter plot titled 'The relationship between the number of children per woman at birth and the percentage of women who are literate'. The vertical axis (y-axis) is labeled 'Number of children per woman at birth' and has major tick marks at 0, 2, 4, 6, and 8. The horizontal axis (x-axis) is labeled 'Percentage of women who are literate' and has major tick marks at 0, 20, 40, 60, 80, and 100. There are approximately 15 data points scattered across the plot. Most points fall between 20% and 80% literacy and 2 to 6 children per woman. Notable outliers include a point near (90%, 7.5 children) and another near (95%, 1.5 children). The overall trend shows that as literacy increases, the number of children per woman tends to decrease.

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The table shows, too, that there is correlation between number of times payment received and index of payments. There is, however, considerable overlapping. In the group of townships which received payments six times, for example, the index of payments groups ranged from 11 to 60 with the highest concentration of townships in the 31-40 group. Similarly, the range in number of times payment received for townships in the 31-40 index of payment group was from four to nine with the largest number of townships having received payment six times.

Further details on benefits in Saskatchewan under the Act are provided in Tables 9 and 10.

Table 9 shows that in Saskatchewan the largest group of farms were in the lowest index of payments group. The payment to this group, however, was relatively small. At the other extreme, farms in townships having an index of payments of 70 and over, numbered only 1,623. Payments to these farms, however, were much greater than to the nearly 19,000 farmers in the lowest index of payments group. The average payment per farmer increased rapidly as the index of payments rose. Not only did farms in the higher index of payments groups get more payments but the payments per year or rates of payment were also higher.

Somewhat similar comparisons can be made in Table 10. The 893 farms in townships which were paid in ten years out of ten, received nearly two and one-half million dollars while the 14,621 farms in townships receiving only one payment received less than two million.

**Table 9.- Prairie Farm Assistance Act Payments in Saskatchewan, 1939-49,  
According to Index of Payments**

| <b>Index of<br/>Payments</b> | <b>Number of<br/>Farmers Paid</b> | <b>Total Payment</b> | <b>Average payment</b> |
|------------------------------|-----------------------------------|----------------------|------------------------|
| <b>- dollars -</b>           |                                   |                      |                        |
| 0 - 9                        | 18,841                            | 2,890,690            | 153                    |
| 10 - 19                      | 15,889                            | 7,192,060            | 453                    |
| 20 - 29                      | 11,442                            | 10,872,080           | 950                    |
| 30 - 39                      | 13,167                            | 17,270,890           | 1,312                  |
| 40 - 49                      | 12,924                            | 21,684,530           | 1,678                  |
| 50 - 59                      | 9,301                             | 19,127,180           | 2,056                  |
| 60 - 69                      | 4,768                             | 11,637,460           | 2,441                  |
| 70 - 79                      | 1,302                             | 3,467,370            | 2,663                  |
| 80 - 89                      | 321                               | 909,830              | 2,834                  |
| <b>All Farms</b>             | <b>87,955</b>                     | <b>95,052,090</b>    | <b>1,081</b>           |

**Table 10.- Prairie Farm Assistance Act Payments in Saskatchewan, 1939-49,  
According to Number of Times Payment has been Received..**

| <b>Number of<br/>times pay-<br/>ment received</b> | <b>Number of<br/>farmers paid</b> | <b>Total Payment</b> | <b>Average<br/>payment</b> | <b>Average<br/>payment<br/>per year</b> |
|---------------------------------------------------|-----------------------------------|----------------------|----------------------------|-----------------------------------------|
| <b>- dollars -</b>                                |                                   |                      |                            |                                         |
| 1                                                 | 14,621                            | 1,926,190            | 132                        | 132                                     |
| 2                                                 | 10,920                            | 3,060,050            | 280                        | 140                                     |
| 3                                                 | 8,331                             | 4,793,990            | 575                        | 192                                     |
| 4                                                 | 6,983                             | 6,047,850            | 866                        | 216                                     |
| 5                                                 | 9,134                             | 10,491,950           | 1,149                      | 230                                     |
| 6                                                 | 12,115                            | 17,425,080           | 1,438                      | 140                                     |
| 7                                                 | 12,214                            | 21,418,720           | 1,754                      | 251                                     |
| 8                                                 | 8,521                             | 17,780,370           | 2,087                      | 261                                     |
| 9                                                 | 4,223                             | 9,692,920            | 2,295                      | 255                                     |
| 10                                                | 893                               | 2,414,970            | 2,704                      | 270                                     |
| <b>All Farms</b>                                  | <b>87,955</b>                     | <b>95,052,090</b>    | <b>1,081</b>               | <b>219</b>                              |

The average payment per farm per year for the former group was \$270 while that of the latter was only \$132. Total individual awards in the ten year period were 581,120. These were made up of 22,534 awards in Manitoba; 409,691 in Saskatchewan; and 148,895 in Alberta, including those of the Peace River District of British Columbia.

### Relation Between Payments and Soil Productivity

One of the factors which could be expected to influence the number and amount of payments to an area is the productivity of the soil. In Alberta, information on soils was available in certain areas. <sup>2/</sup> The soils were mapped on the basis of physical features into classes ranging from 2 to 8. Class 2 soil represented the best grade and Class 8 the poorest. Information on Prairie Farm Assistance Act payments by soil type is shown in Table 11.

Table 11.- Payments Under the Prairie Farm Assistance Act According to Soil Class, Alberta, 1939-49.

|                           | Soil Class |           |             |
|---------------------------|------------|-----------|-------------|
|                           | 2 and 3    | 4 and 5   | 6, 7, and 8 |
| Number of farmers paid    | 1,627      | 1,812     | 1,093       |
| Total payment (dollars)   | 2,618,420  | 3,051,620 | 2,057,240   |
| Average payment (dollars) | 1,609      | 1,684     | 1,882       |

<sup>2/</sup> See Land Class Map of Sullivan Lake Sheet, and Soil Rating Map of Milk River Sheet. Prepared by the Department of Soils, University of Alberta, in co-operation with the Experimental Farms Service, Dominion Department of Agriculture (P.F.R.A.).

The average payment per farm increased from \$1,609 for farms on the best soils to \$1,882 for farms on the poorest soils. Although there was a difference of \$273 per farm it shows that even farms on good soils were subject to numerous crop failures.

In Saskatchewan, in addition to a comprehensive soil classification map, there are economic land classification maps. The economic classification covers most of the prairie area and regional maps are included in a number of reports.<sup>3/</sup> Table 12 shows payments by the predominant economic land class. Land Class I represents the poorest land for wheat production and Land Class V the best.

For the classified area, the table shows the effect of land class on the amount and numbers of times that payments have been received. Generally, the poorer the land the larger was the proportion of farms receiving numerous and large payments. None of the townships predominantly in Land Class V received payments more than six times. More than 13 million dollars were paid to farms in townships which were predominantly Land Class I. This class of land is considered submarginal for wheat production. About 26 million dollars were paid

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<sup>3/</sup> The reports represent cooperative projects of the Economics Division, Canada Department of Agriculture and the Farm Management Department, University of Saskatchewan, Saskatoon. Hope, E.C., and C.C. Spence, An Economic Classification of Land in Fifty-Six Municipal Divisions, South Central Saskatchewan, Technical Bulletin 36, 1941; Spence, C.C., S. Mysak and R.A. Stutt, An Economic Classification of Land and Its Relation to Farm Income, Eyebrow-Lacadena Area, Saskatchewan, 1941; Stutt, R.A., and S. Mysak, An Economic Classification of Land in the Weyburn-Estevan Area, Saskatchewan, 1943; Spence, C.C. and E.C. Hope



to those farms in townships classed predominantly as Land Class II, which is considered marginal for wheat production. The average payment per farm declined progressively from \$1,965 for farms in Land Class I to \$834 per farm in Land Class V. The difference would have been even greater if all townships in the classified area had been included. A number of townships in Land Class V received no payment at all and, therefore were not included in the table. An average payment for all farms in Land Class V would be smaller than the \$843 for only those Class V farms which had received payments. All of the townships in Land Class I, except those used for ranching purposes, received at least one payment.

Even acknowledging the important relation between quality of land and payments under the Act, there are substantial payments to farms on the best land. Nearly one million dollars were paid to farms in townships predominantly classed as the best for wheat production in the province. In spite of the superior drought resistant quality of this land, weather conditions were sometimes so unfavorable as to result in crop failure. In Manitoba, soil or land classification had not been developed to the stage which would allow a similar analysis for that province.

An Economic Classification of Land and Its Relation to Farm Types and Income, Blucher-Colonsay Area, Saskatchewan, 1948; Stutt, R.A., An Economic Classification of Land in the Elrose-Rosetown-Conquest Area, 1948; Stutt, R.A., A Farm Business Study with Particular Reference to the Relation of Farm Types and Land Class, Cory-Asquith-Langham Area, Saskatchewan, 1949; Stutt, R.A., An Economic Classification of Land

The above indicates that payments under the Prairie Farm Assistance Act have not been evenly distributed. In general, they have been the greatest in southwest Saskatchewan and in southeast and east central Alberta. Within these general areas there were differences due to soil type and differences in weather conditions.

**Relation Between Payments and Levies According to  
Soil Productivity**

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Unfortunately, a regional breakdown of funds raised by means of the one per cent levy was not available. Such a detailed breakdown would have allowed comparisons of levy and payments or premiums and indemnities for small homogeneous areas. The only breakdown as to the source of the one per cent levy was by provinces. Even this shows that the levy in Manitoba produced about 7.7 million dollars from 1939 to 1949 while payments amounted to only 2.6 million dollars during the same period. The levy or premiums, therefore, amounted to 295.8 per cent of the payments or indemnities. A similar comparison for Saskatchewan shows that the levy produced about 26.3 million while payments amounted to more than 95 million dollars for a levy-payment

in the Govenlock-Eastend-Maple Creek Area, Saskatchewan, 1951; Riecken, T.O. and M.E. Andal, A Farm Business Study in the Fox Valley-Eston-Kindersley Area of Saskatchewan, 1952; and Zeman, J., An Economic Classification of Land and A Study of Farm Organization of the Biggar-Kerrebert-Unity Area, 1953.



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Table 12.-Prairie Farm Assistance Act Payments in Saskatchewan 1939-1949 According to  
Predominant Economic Land Class

| Number of<br>times payment<br>received | Economic Land Class |                 |                     |                 |                     |                 |                     |                 |
|----------------------------------------|---------------------|-----------------|---------------------|-----------------|---------------------|-----------------|---------------------|-----------------|
|                                        | I                   | II              | III                 | IV              | V                   |                 |                     |                 |
|                                        | Payment<br>per farm | No. of<br>farms | Payment<br>per farm | No. of<br>farms | Payment<br>per farm | No. of<br>farms | Payment<br>per farm | No. of<br>farms |
|                                        | \$                  |                 | \$                  |                 | \$                  |                 | \$                  |                 |
| 1                                      | 240                 | 1               | 388                 | 183             | -                   | -               | 214                 | 152             |
| 2                                      | 822                 | 6               | 454                 | 184             | 498                 | 218             | 456                 | 217             |
| 3                                      | 696                 | 23              | 804                 | 895             | 753                 | 488             | 738                 | 235             |
| 4                                      | 864                 | 103             | 1,124               | 1,385           | 1,196               | 628             | 912                 | 165             |
| 5                                      | 1,068               | 423             | 1,385               | 1,927           | 1,480               | 1,046           | 1,315               | 278             |
| 6                                      | 1,467               | 853             | 1,698               | 3,512           | 1,752               | 1,075           | 1,614               | 67              |
| 7                                      | 1,738               | 1,301           | 1,939               | 3,200           | 2,100               | 504             | -                   | -               |
| 8                                      | 2,112               | 1,632           | 2,288               | 2,150           | 2,504               | 105             | -                   | -               |
| 9                                      | 2,306               | 1,804           | 2,394               | 728             | 2,574               | 51              | -                   | -               |
| 10                                     | 2,654               | 580             | 2,480               | 64              | -                   | -               | -                   | -               |
| Total farms                            |                     | 6,726           |                     | 14,409          |                     | 4,115           |                     | 1,114           |
| Total payment                          | 13,218,120          |                 | 24,082,430          | 6,105,640       |                     | 929,140         |                     |                 |
| Average payment                        | 1,965               |                 | 1,693               | 1,484           |                     | 834             |                     |                 |

ratio of 27.6 per cent. Corresponding figures for Alberta were about 14.1 million, 27.6 million and a levy-payment ratio of 50.9 per cent. Thus, even the breakdown for large provincial areas, wherein much averaging of differences in levy-payment ratios have already taken place, shows the absence of any actuarial relationship between the levy and payments.

The establishment of the relationship between the levy and payments for much smaller than provincial areas was considered fundamental to an appraisal of the insurance feature of the program. Although statistics were not adequate enough to allow an accurate comparison, there were enough so that approximations could be made. Information on payments to each township was available so that obtaining this figure presented no difficulty. The figures on the amount of money raised by the levy were not available for each township or any other small area and they had to be calculated. Since the levy amounted to one per cent of the value of grain sold, this process involved obtaining an estimate of the value of grain sold in each township or area.

The productivity of soil was shown in Tables 11 and 12 to be related to the rate of benefits. Since yields and the levies are inversely related to benefits and at the same time related to soil productivity, the separation of farms into homogeneous soil groups would be one basis of grouping individuals with similar risks. All of the soil types in Saskatchewan have been given comparative ratings

based mainly on their suitability for growing wheat.<sup>4/</sup> These range from 19 to 87 and the townships so rated were placed into ten categories. Category one included the best soil and ten the poorest. The problem then was to show the relation between the levy and the benefit in each of the ten soil categories.

Individual farm records in the 59 sample townships were used in this analysis. These "Cultivated Acreage Report" records covered the period 1945 to 1949 inclusive and included for each farm the following pertinent information: grain production, numbers of livestock, grain acreages, and payment received. In general, the procedure used to determine the value of grain sold from each area was to calculate total grain production, subtract estimated feed and seed requirements and apply the market price to the balance. One per cent of this amount would be approximately equal to the levy for the area.

The amount of wheat, oats, barley and rye (the grains on which the one per cent levy is made) produced was available from records of the Prairie Farm Assistance administration only for those years in which the townships received payments. For other years, the production of grain had to be estimated. For these non-payment years the acreages in the various grain crops were assumed to be the same as those in the nearest payment year. If a non-payment year for a township occurred between two payment years, then the average in the non-payment year was considered to be the average of the acreages in the

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<sup>4/</sup> Mitchell, J., H.C. Moss and J.S. Clayton, op. cit., pp. 196-197.

two payment years for which this information was available.

In the non-payment years there was also no information on yields. Annual estimates of yields for various crops were available, however, on a municipal<sup>5/</sup> basis.<sup>6/</sup> As later analysis will show, average yields based on estimates of the Supervisor of Statistics were a little higher than average yields obtained in records of the Prairie Farm Assistance Administration. In order to maintain a uniform yield level for payment and non-payment years, one bushel per acre was subtracted from average yields obtained from the Supervisor of Statistics. Estimates of acreages and yields obtained in this way were used to determine the amount of grain produced in those years for which production data were not available from Prairie Farm Assistance Act records.

The next step in arriving at amounts of grain sold was to deduct seed requirements. Data on acreages of the various crops were available for years in which payment was made and acreages for other years were estimated as described above by interpolation and extrapolation. By applying per-acre requirements to these acreages, an allowance for seed was estimated.

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<sup>5/</sup> A municipality normally consists of nine townships. Although municipal yields need not necessarily be the same as that of individual townships within those municipalities due to variability of soil and other conditions, the municipal yield data were the best available.

<sup>6/</sup> The yield data for municipalities were obtained from unpublished data of the Supervisor of Statistics, Saskatchewan Department of Agriculture, Regina, Saskatchewan.

Estimates of feed requirements were based on numbers of livestock on farms. Numbers of various classes of livestock were indicated on the farm records and these again were available only for those years for which payment was made. For other years, the numbers of livestock were assumed to be the same as those in the closest year for which that information was available. Grain used for feed for each year was calculated on the basis of estimated requirements for each class of animals. For cattle this was considered to be 20.8 bushels of barley or the equivalent of 29.7 bushels of oats per head. For hogs the corresponding figures of barley and oats were 26.0 and 36.0; and for sheep, 2.0 and 2.8 bushels, respectively. If the aggregate production in any year did not cover these feed and seed requirements, it was assumed that the feeding level was reduced to a level that would restore a balance between production and consumption. The balance of the grain produced was considered to be sold.

One per cent of the value of grain sold was deducted from the proceeds of the sale and transferred to the Prairie Farm Emergency fund. This levy was made on the price to the farmer at the local elevator. The Port Arthur-Fort William prices for wheat, oats, barley and rye are shown in Table 13.

Deductions for handling charges were made in accordance with those shown in Table 14.

Table 13.-Prices of Grain at Port Arthur-Fort William, 1945-1949

| Year | Grain                   |                         |                |               |
|------|-------------------------|-------------------------|----------------|---------------|
|      | No. 2 Northern<br>Wheat | 3 C.W.(6-row)<br>Barley | 3 C.W.<br>Oats | 2 C.W.<br>Rye |
|      | - dollars per bushel -  |                         |                |               |
| 1945 | 1.803                   | 0.798                   | 0.615          | 1.709         |
| 1946 | 1.803                   | 0.848                   | 0.651          | 2.498         |
| 1947 | 1.803                   | 1.247                   | 0.811          | 3.545         |
| 1948 | 1.803                   | 1.192                   | 0.766          | 1.700         |
| 1949 | 1.803                   | 1.388                   | 0.815          | 1.449         |

Table 14.- Elevator Handling Charges for Grain, 1945-1949.

| Year | Grain                |        |      |      |
|------|----------------------|--------|------|------|
|      | Wheat                | Barley | Oats | Rye  |
|      | - cents per bushel - |        |      |      |
| 1945 | 3.0                  | 3.5    | 3.0  | 5.0  |
| 1946 | 3.0                  | 4.5    | 4.0  | 5.0  |
| 1947 | 3.5                  | 6.0    | 5.0  | 5.0  |
| 1948 | 4.5                  | 5.5    | 4.5  | 7.25 |
| 1949 | 4.5                  | 4.5    | 3.5  | 5.5  |

Source: The Saskatchewan Wheat Pool and Its Accomplishments. The Saskatchewan Wheat Pool, Regina, 1952, p. 44.

Freight rates on grain to Port Arthur-Fort William from Saskatchewan ranged from 18 cents to 25 cents per 100 pounds.<sup>7/</sup> The 22 cent freight rate runs through the center of the province and this rate was used in obtaining the freight charges on grain. The farm

<sup>7/</sup> Freeman, T.H., W.E. Thomson and C.H. Chappell, The Saskatchewan Rural Land Assessment System, Saskatchewan Department of Municipal Affairs, Regina, 1950, p. 164.

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prices for grains on which the one per cent levy was made are shown in Table 15. The application of these prices to the estimated quantities of grain for sale provided the value figure for grain sold. One per cent of these values represented the amount collected from farms in the various townships as "premiums" for crop failure benefits. A comparison of the levy with the Prairie Farm Assistance Act payments gives the levy-benefit or premium-indemnity ratio. Table 16 shows these ratios according to soil productivity.

Table 15. -Farm Prices Before One Per Cent Levy for Grains, 1945-1949.

| Year | Grain                  |        |       |       |
|------|------------------------|--------|-------|-------|
|      | Wheat                  | Barley | Oats  | Rye   |
|      | - dollars per bushel - |        |       |       |
| 1945 | 1.641                  | 0.658  | 0.510 | 1.536 |
| 1946 | 1.641                  | 0.698  | 0.536 | 2.326 |
| 1947 | 1.636                  | 1.136  | 0.686 | 3.372 |
| 1948 | 1.626                  | 1.032  | 0.646 | 1.505 |
| 1949 | 1.626                  | 1.238  | 0.705 | 1.272 |

In general, the levy-payment ratio declined as the productivity of the soil declined. Farmers on the best soil paid about \$150 in levies for each \$100 received in benefits. On the other hand, those on the poorest soils paid about \$7 in levies for every \$100 in benefits received. Soil categories 2 and 9 did not fit into the trend and this may be due to the effect of their distribution between the park and prairie areas. A higher proportion of these soils in the prairies than of the other soils would tend to lower the levy-payment ratio for these two groups.

**Table 16.-Relation Between Soil Productivity and Levy-Payment Ratio, Prairie Farm Assistance Act, 1945-1949 inclusive**

| Soil Category | Levy-Payment Ratio |
|---------------|--------------------|
|               | - per cent -       |
| 1             | 152.6              |
| 2             | 31.4               |
| 3             | 62.2               |
| 4             | 43.9               |
| 5             | 18.7               |
| 6             | 13.6               |
| 7             | 11.4               |
| 8             | 9.8                |
| 9             | 6.0                |
| 10            | 7.1                |
| All Soils     | 15.8               |

**Relation Between Payments and Levies According to  
Index of Payments**

Probably a better basis of obtaining homogeneous groups of farmers for calculation of this ratio is to group them according to index of payments. On this basis, they would be grouped according to the benefits they have received under the Act. This would automatically take into consideration the differences in soil, location, weather and other factors which have an influence on the levy-payment ratio. The relation between index of payments and levy-payment ratio appears in Table 17.

Farmers in the prairie area who have received between 1 and 29 per cent of maximum possible benefits under the Act have contributed in the form of the levy about 85 per cent of the benefits they have received. As the rate of benefits increased, the proportion covered



by the levy rapidly decreased, and farms which received 90 per cent or more of possible maximum benefits only paid \$1.20 for every \$100 in benefits. A somewhat similar situation existed in the park area where the levy-payment ratio ranged from 53.6 to 6.8 per cent.

Table 17.-Relation Between Index of Payments and Levy-Payment Ratio, Prairie Farm Assistance Act, 1945-1949, inclusive.

| Index of<br>Payments | Levy-Payment<br>Ratio |
|----------------------|-----------------------|
|                      | - per cent -          |
| Prairie Area: 1 - 29 | 85.0                  |
| 30 - 49              | 14.3                  |
| 50 - 69              | 6.9                   |
| 70 - 79              | 3.3                   |
| 80 - 89              | 2.4                   |
| 90 and over          | 1.2                   |
| Park Area: 1 - 29    | 53.6                  |
| 30 - 49              | 9.3                   |
| 50 - 69              | 6.8                   |
| Average: both areas  | 16.8                  |

This analysis shows that between groups of farms which are homogeneous with respect to experience under the Prairie Farm Assistance Act there are very large differences in the levy-payment ratios. To the extent that the program is one of insurance, it fails to meet the required test of equal levy-payment ratios for various groups of farms as set out in the previous chapter.

A limitation of the information in the previous table is that the yields on which it is based are only for a five year period. A

longer period would have been desirable but data for a longer period were not available. This limitation does not apply so much to the table itself, since the relationship established for the five years will not change much with changing yields over a longer period. That is, if a township in the 90 and over index of payment category has a series of good crops in the next five years, it would simply shift to a lower category and the relationship established in Table 17 would still hold.

The limitation would apply more in the application of these ratios to specific townships. That is, if it were decided to establish actuarial premium and indemnity rates on the basis of information in Table 17 and Figures III, IV and V, the rates would be applicable only to the extent that the index of payments data in the figures are representative of longer term conditions. Reference has already been made to the difficulty of establishing the yield variability which is likely to prevail in the future. In spite of this difficulty, however, Table 17 together with Figure IV is a step toward classifying farms into similar risk categories and in indicating approximate actuarial structures for the program in Saskatchewan. They may also apply in Alberta and Manitoba.

The relationships established in Table 16, however, would change whenever the yield level and variability changed from that existing in 1945-49. It is likely, however, that the relative levy-payment ratios for the various soil productivity categories would not change drastically on this account.

The yield level for 1945-49 can be compared with those of other periods. Although such a comparison can not serve as a basis for re-establishing the levy-benefit ratio shown in Table 17, due to the importance of yield variability, they do give some indication of the probable range in average yields and of probable general effects on the ratio. The average wheat yield in Saskatchewan for the period 1945-49, the period on which Tables 16 and 17 are based, was 12.9 bushels per acre. During the low yielding period of the 1930's, the average yield was 10.4. A period of relatively good years, 1940-44 had an average wheat yield of 17.5 and the long time average yield from 1908-1945 was 14.9. Therefore, it might reasonably be expected that the long term average yield and therefore the levy, if price remains the same, might be somewhat higher than that shown in the tables. The yield of other grains in the period 1945-49 had about the same relation to their long time yields as did wheat.<sup>8/</sup>

In addition to the limitation imposed by some non-representativeness of yield, Tables 16 and 17 are subject to limitations imposed by non-representativeness of grain prices. The average farm price of wheat during the period 1945-49 was more than \$1.60 per bushel. This was higher than the average annual price for any year since 1919 and it is probably higher than prices which will prevail for any long period in the future. Since the one per cent levy was made on the value of

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<sup>8/</sup> These yield data were obtained from Handbook of Agricultural Statistics, Dominion Bureau of Statistics, Ottawa, 1951, pp. 9, 21, 33 and 44.

grain, the levy during this period will have tended to be greater than it would have been over a longer period of time. The price of wheat during 1945-49 was nearly twice as high as the average price during the five year period immediately preceding it and it was 2.7 times as high as that prevailing during the period 1930-39. The average price for the period 1908-49 was \$1.00 per bushel. Thus, the levy per bushel of wheat during 1945-49 was 63 per cent higher than the levy would have been on the basis of these long term prices. The average price of oats was 67.4 per cent higher during 1945-49 than during 1908-49. The corresponding percentages for barley and rye were 79.2 and 231, respectively.<sup>9/</sup> The levy per bushel for these grains was also much higher during 1945-49 than would be on the basis of average long term prices.

Considering both yields and prices for the 1945-49 period in relation to their long term levels it is possible to conclude that the long term levy-benefit ratio is likely to be somewhat lower than those shown in Tables 16 and 17. As has been mentioned previously, however, it is not possible to indicate how much lower it might be. Although the levy can be determined to a large extent on the basis of average yields and prices, the amount of benefits depend on the variability of crop yields rather than on the average.

Referring again to Table 17, it is noted that levy-payment ratio was higher in the prairie area than in the park area for corresponding

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<sup>9/</sup> Loc. cit.

index of payments groups. Probably the main reason for this is because farms were larger in the prairie area. No payments were made for any cultivated acreage over 400. A much higher proportion of the farms in the park area would have come in under this limit and, therefore, have received larger benefits per acre than farms larger than this. A further point in this connection is that the sample was selected from townships which had received benefits under the Act. A larger proportion of the townships in the park area than in the prairie area had received no payments. From these townships there have been levies but no payments. The table then is not representative of the whole park area or the whole prairie area but only of these townships from which the sample was selected.

The average levy-payment ratio in Table 16 was 15.8 and in Table 17 it was 16.8. This difference arose out of computational procedure. It will be recalled that in calculating feed requirements, where there was not sufficient grain produced to meet estimated feed requirements, it was assumed that the feeding rate was reduced to the amount of feed available. In sorting townships by index of payment, those with a high index of payments (crop failures every year) would have reduced amounts of grain for feed so that the average calculated feed requirements for all townships in this work was less than estimated requirements and, therefore, there was more to be sold. In the breakdown by soils (Table 16) some of the high index of payment townships were averaged with others so that in each group there was sufficient grain



produced for estimated feed requirements. Thus, for all the townships in the breakdown by soils there was a larger amount of grain considered to be used for feed and a smaller amount sold.

It was pointed out on page 89 that taking aggregate figures of levy and payments for Saskatchewan that the levy amounted to 27.6 per cent of payments. Tables 16 and 17 present an average for the sample of about 16 per cent. The difference arose because the sample was selected only from townships which had received benefits while the aggregate figures included levies obtained from all townships, including those which had received no payments. Also, Tables 16 and 17 are calculated for the period 1945 to 1949. The aggregate ratio of 27.6 per cent was for the period 1939 to 1949. The aggregate ratio for the period from 1945 to 1949 was less than 25 per cent.

## VI. EFFECT OF THE PROGRAM ON RESOURCE ALLOCATION

A large program of this kind is likely to have some effect on the way in which resources are used. If there are substantial amounts of misallocated resources because of the Act, they represent an important real cost to the economy. A difficulty in an appraisal of this kind is the fact that there are many things probably more important than the existence of the Act which affect farmers' decisions regarding the allocation of resources. There are also many things, other than the Act, which affect decisions made by people other than farmers regarding the disposition of resources within and outside of agriculture. The whole price structure, past, existing and expected, plays a major role. Government legislation and programs involving credit have an important role in affecting the allocation of resources within agriculture, and between agriculture and other segments of the economy. Customs and institutions affect decisions with respect to resource use. The people themselves who make the decisions probably are not aware of the extent to which each affect their decisions. It is unlikely, too, that a farmer when asked what he would do in the absence of the Act, would give an answer entirely consistent with his actions if actually confronted with the situation. Determination of the effects of the Prairie Farm Assistance Act on resource allocation must be based, therefore, to a large extent on deductive reasoning

rather than on empirical proof. Empirical data might well serve as evidence of reasons for certain activity but they can hardly serve as proof. This chapter, then, will be devoted to analyzing and presenting probable tendencies which the Act would have in affecting the use of resources.

#### Establishment of Budgets for Representative Farms

The effect of the Act on the allocation of resources would depend, to a large degree, on the relation between farm income, and income obtained under the Act. The relative sizes of these incomes depend, in turn, on the characteristics of the individual farms. The characteristics of farms vary widely and it is, therefore, necessary to confine the analysis to a few representative ones. Among the important factors which have effects on farm income are size of farm, prices and crop yields. Budgets were established for farms representative of various sizes, price and yield levels.

Farm Size. A distribution of farms in the 59 sample townships by size is shown in Table 18.

This distribution shows that in the prairie area about 37 per cent of the farms were one- and two-quarter sections in size. Most of these were half-section farms. Nearly 40 per cent were three- and four-quarter section farms. About 23 per cent of the farms were more than one section in size. In comparison, the 1946 Census of Saskatchewan indicated that nearly 45 per cent of the farms in this area of Saskatchewan were one- and two-quarter section farms, 40.5

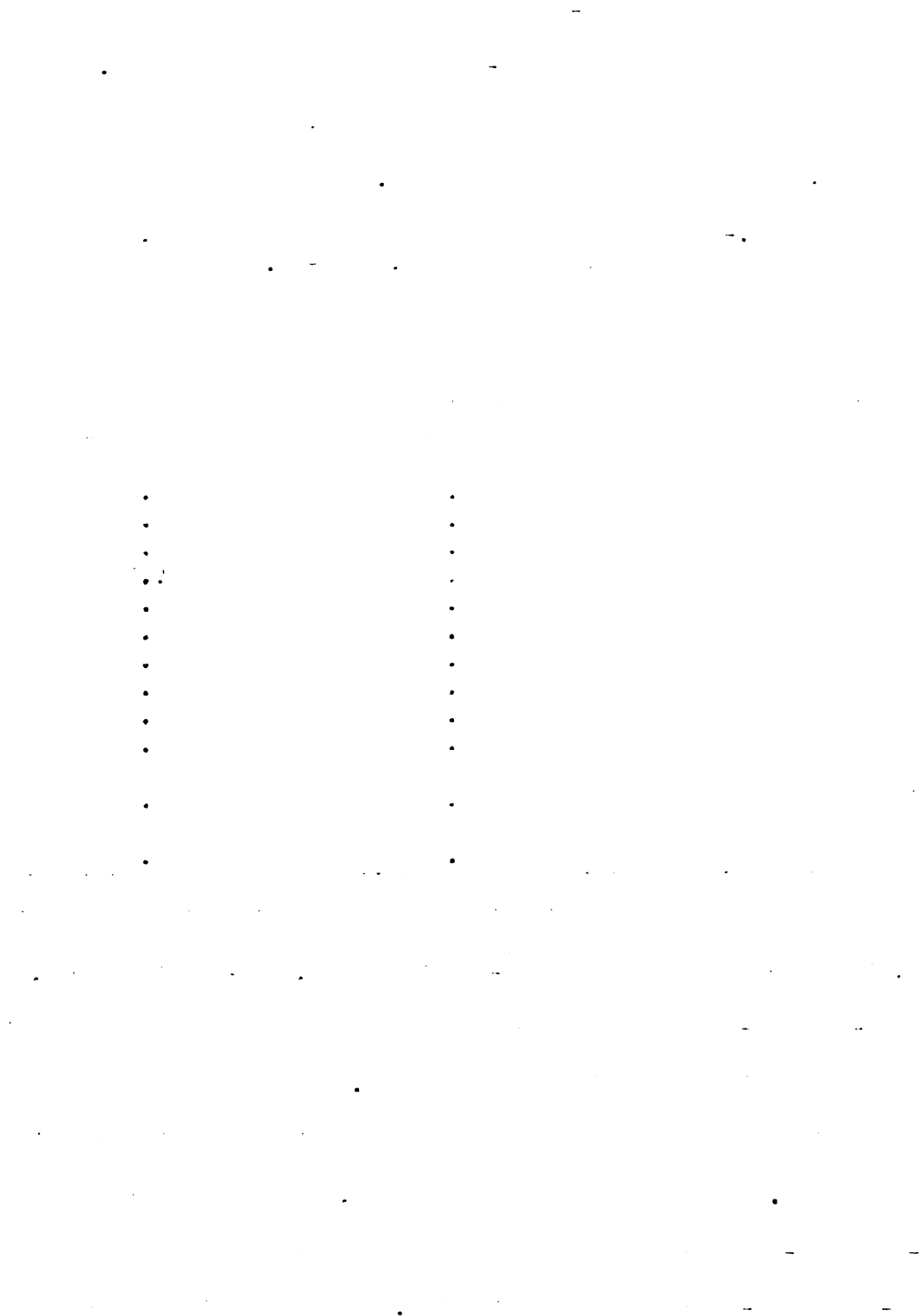
per cent were, three-, four- and five-quarter section farms and about 13 per cent of the farms were six-quarter sections and larger. These figures include very small farm holdings which, from the standpoint of this study, would not be considered farms.

Table 18.-Percentage Distribution of Farms by Sizes,  
59 Townships, Saskatchewan, 1945-49.

| Number of Quarter<br>Sections | Prairie Area          | Park Area |
|-------------------------------|-----------------------|-----------|
|                               | - per cent of total - | -         |
| 1                             | 9.6                   | 29.5      |
| 2                             | 27.3                  | 35.0      |
| 3                             | 20.5                  | 17.2      |
| 4                             | 19.2                  | 9.1       |
| 5                             | 9.8                   | 4.5       |
| 6                             | 5.9                   | 2.8       |
| 7                             | 2.9                   | 0.8       |
| 8                             | 1.9                   | 0.4       |
| 9                             | 1.4                   | 0.2       |
| 10                            | 1.4                   | 0.3       |
| No information                | 0.1                   | 0.2       |
| Total                         | 100.0                 | 100.0     |

In accordance with the distribution of farm sizes in the prairie area, it was considered that half-section farms, one-section farms, and one-and one-half section farms would adequately represent the main group of farm sizes found in the population.

The distribution of farms by size was considerably different in the park area. In the sample group of farms, about 65 per cent were one- and two-quarter sections and about 26 per cent of the farms were three- and four-quarter sections in size. Less than nine per cent



were five-quarter sections and over in size. For the park area, the 1946 Saskatchewan Census shows in comparison that 70.4 per cent of the farms were one- and two-quarter sections in size, 23 per cent were three-, four- and five-quarter sections in size and slightly less than three per cent of the farms were six-quarter sections and larger. Thus, in this area, 97 per cent of the farms were five-quarter sections or smaller. Accordingly, it was considered that one-half section and one section farms would represent the main groups of farm sizes in this area.

Price Level. The general level of prices has an important effect on the relation between farm income and payments under the Act. In general, farm prices tend to fluctuate to greater extremes and more rapidly than other prices. Prairie Farm Assistance payments, on the other hand, are fixed regardless of the general level of prices. There is one exception. Payments are made to farmers in the third category, eight to twelve bushels per acre, when the price of wheat falls below 80 cents per bushel. Payments in this category amount to ten cents per cultivated acre for each cent, not exceeding ten, that the price in store Fort William-Port Arthur for No. 1 wheat is below 80 cents. Because of deductions for freight, handling and grade, this represents an average farm price of about 60 cents per bushel. Payments under this section of the Act were made only in the early years of its operation when the price of wheat was very low.

Except for this special category, payments to farmers bear no relationship to the price of wheat or to the price level in general. Thus, in a period of low prices, payments under the Act would

constitute a higher proportion of total income than it would in a period of high prices.

The effect of the Act on resource allocation, therefore, depends to some extent on the general level of prices. In order to consider this effect, farm income was examined in relation to Prairie Farm Assistance payments under conditions of low, medium and high levels of prices.

The period chosen to represent a low price level was that from 1930 to 1939. This is a level which has actually been experienced and probably represents the lowest extreme to which prices might fall for a short period of time. The period chosen to represent a high level of prices was that of 1943 to 1949.

The selection of an intermediate level of prices was based on what might be considered to be a long time average level of prices. It is impossible, of course, to predict what prices will be in the future. Schultz expressed the view<sup>1/</sup> which may now be partially obsolete, that prices of agricultural products will continually tend to be depressed relative to prices of other products because of a decline in the rate of population growth, rapid technological advances in agriculture and a low income elasticity of farm products. A report<sup>2/</sup> to the President of the United States presents a contrary

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<sup>1/</sup> Schultz, T.W., Agriculture in an Unstable Economy, pp.81-84.  
<sup>2/</sup> Resources for Freedom, A Report to the President by the President's Materials Policy Commission, Washington, 1952, pp.73-75.

view. This report projects the 1950 average relationship between agriculture and other sectors of the economy to 1975. A similar position <sup>3/</sup> was taken by the Governor of the Bank of Canada who presented the opinion that the current favorable position of the relative prices for raw materials may be a continuing one. Boger <sup>4/</sup> expressed a similar view. Because of increases in population and high levels of defence spending, he predicted that 1960 farm prices would be about eight per cent above 1952 levels.

On the basis of the above, the intermediate level of farm prices used here was somewhat above the long time average and is represented by the level prevailing from 1939 to 1949. The use of this level of prices has the further advantage of being the price level actually in existence during the period in which the Act has been in operation. Relationships which are established with the use of this intermediate level of prices will be those that existed during the period in which the Act has been operating. For comparative purposes, the average Saskatchewan farm prices of grain for each of these periods are shown below.<sup>5/</sup>

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<sup>3/</sup> Towers, Graham, Some Aspects of International Trade. An address to the Investment Dealers of Canada, St. Andrews-by-the-Sea, New Brunswick, June 13, 1952.

<sup>4/</sup> Boger, L.L., Agricultural Outlook for 1960, Michigan Farm Economics, Department of Agricultural Economics, Michigan State College, June 1953.

<sup>5/</sup> Handbook of Agricultural Statistics, op. cit., pp. 9, 21, 33 and 34.



|         | <u>Wheat</u><br>\$ | <u>Oats</u><br>\$ | <u>Barley</u><br>\$ | <u>Rye</u><br>\$ |
|---------|--------------------|-------------------|---------------------|------------------|
| 1930-39 | 0.60               | 0.22              | 0.31                | 0.37             |
| 1939-49 | 1.18               | 0.49              | 0.69                | 1.22             |
| 1943-49 | 1.50               | 0.61              | 0.88                | 1.70             |
| 1908-49 | 1.00               | 0.38              | 0.53                | 0.84             |

Average Yields. The relation between farm incomes and payments under the Act is affected further by the yields of grain. Average yields, in turn depend on soil productivity. In setting up budgets for farms in the prairie area a typical soil was selected. Weyburn loam was chosen as a typical and average quality soil type. The average 1921-49 and 1921-50 wheat yields for this soil as determined in different surveys was 13 bushels per acre.<sup>6/</sup> In the park area, farm business surveys <sup>7/</sup> have shown that the average wheat yield for the period 1932 to 1941 was 24.8 bushels per acre on summerfallow, 20.4 on stubble and 30.6 on new breaking. Since, however, new breaking is becoming less common the assumed yield was taken as the average of stubble and summerfallow yields which was 22.6 bushels per acre.

The average yields for other grains were based on the relationship between wheat yields and other grains as established on a municipal basis by the Statistics Branch, Saskatchewan Department of Agriculture. These data <sup>8/</sup> showed that for the period 1918 to 1947 in the prairie

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<sup>6/</sup> Unpublished data, Economics Division, Canada Department of Agriculture.

<sup>7/</sup> Stutt, R.A., and H. Van Vliet, An Economic Study of Land Settlement in Representative Pioneer Areas of Northern Saskatchewan, Economics Division, Canada Department of Agriculture in co-operation with Department of Farm Management, University of Saskatchewan, Ottawa. Technical Bulletin No. 52, June 1945, p. 46.

<sup>8/</sup> Unpublished.

area, oat yields were 1.97 times and barley 1.41 times that of wheat. In the park area, oat and barley yields were found to be 1.78 and 1.40 times that of wheat, respectively. The yield of rye was assumed to be the same as that of wheat.

Incomes based on yields in "crop failure" years is probably more significant in this discussion than incomes based on average yields. Payments are made in crop failure years, and the relationship of the payments to farm income in these years is the significant one. As indicated previously, there were two categories of payments, one for an average wheat yield between four and eight bushels per acre and the other for an average wheat yield between zero and four bushels per acre. Accordingly, the yields for these categories were assumed to be the mid-point within each of the respective ranges, that is at six and two bushels per acre, respectively. The yields of other grains in these categories were assumed to have the same relationship to wheat as established above.

Farm cash living expenses, like farm receipts and expenses, vary considerably between farms and between areas. Living expenses are flexible and are usually the residual items of the financial picture. In addition, living levels are usually adjusted from one period to another depending on general prosperity.

Living Expenses. Cash living expenses have been determined for a number of areas in the prairie provinces.<sup>9/</sup> The living expenditures for these areas were adjusted for changes in the index of farm living costs to the periods, 1930-39, 1939-49 and 1943-49. The average annual cash living expenses for these areas, adjusted for price changes to the periods indicated were \$836, \$1,061 and \$1,145, respectively for an average size family of 4.5. For west central Saskatchewan, the average of 1943 and 1947 cash living expenses adjusted to the three base periods were \$854, \$1,084 and \$1,170 for an average size family of 4.6. Since the figures for west central Saskatchewan are close to the overall average and since they are considered to be more representative of Saskatchewan conditions, they are used in subsequent analyses.

Although in normal years larger farms would allow increased expenditures for living, in years of crop failure, these expenditures would both tend to be more nearly equal. Thus, expenditures for living were assumed to be equal for the various sizes of farms in the two areas.

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<sup>9/</sup> MacNaughton, M.A., J. W. Mann, and M. B. Blackwood, Farm Family Living in South Eastern Saskatchewan, 1947-48, Economics Division, Canada Department of Agriculture, Ottawa, 1950, p. 8, and MacNaughton, M.A. and M.E. Andal, Changes in Farm Family Living in Three Areas of the Prairie Provinces, from 1942-43 to 1947, Economics Division, Canada Department of Agriculture and Department of National Health and Welfare, Ottawa, in co-operation with the Universities of Alberta and Saskatchewan, Ottawa, Technical Bulletin 69, February 1949, pp.30-38.

The general considerations of farm sizes, prices, yields and living expenses have been discussed above. A large number of other and possibly more minor considerations were involved in the establishment of these budgets. These have to do with land use, disposition of grain, machinery and building requirements and various expenses and receipts. The details of how these were calculated are given in Appendix II.

#### Effect of the Levy

Turning to the specific question of the effects of the Act on resource allocation, the question of the levy might first be considered. Theoretically, it might be considered that since there is a levy on grain sold as such, the levy can be avoided by feeding grain to livestock and that there might be a tendency to promote the production of livestock. Actually, the levy is so small that such a diversion in production practice probably is not even given consideration. The uncertainty of price and yield prevents precise calculations of alternative returns possibilities and the one per cent levy on grains would have no appreciable effect in diverting grain through livestock. Similarly, the part of the funds raised through general taxes is such a small part of the total that its collection would have no appreciable effect on resource allocation. It might be noted that there is no levy on sales of flax. There is again the theoretical possibility that land might be devoted to flax production at the expense of other grains but again the

differential is so small that other factors such as prices far outweigh it. Any effect on resource allocation will, therefore, come about through the disposition of Prairie Farm Assistance Act payments to farmers.

### Effect of the Payments

An important feature of the payments is that they are made on an acreage basis rather than on a per bushel basis. In addition to the desirability of this method from the standpoint of providing income to those who need it, it also avoids disturbing the relative price structure between crops. There is no reason to expect, therefore, that a farmer would seed relatively more wheat, oats, barley or rye. Since seeded grass is considered as cultivated land there is also no reason to expect that land would be taken out of this crop and seeded to grain. Similarly, summerfallow is classed as cultivated land under the Act so that there is no reason to expect that the Act has any effect on the amount of summerfallow in relation to other crops.

For farms with a cultivated acreage below 400, there would be a tendency to increase the cultivated acreage, since payments are made on an acreage basis up to a maximum of 400 acres. The disturbing feature of such a tendency is that the extension of cultivation would likely be confined to poor land because the better land presumably would already have been under cultivation. It is impossible to measure empirically the extent of this tendency because of the complications and complexities of other factors. The incentive in terms

of possible benefits for increased cultivated acreage up to 400 is 75 cents per acre if the wheat yield in the township is four to eight bushels and \$1.25 per acre if the yield is between zero and four bushels per acre. Information on acreages is shown in Table 19 for townships in the sample which received benefits under the Act in every year between 1945 and 1949. There were 12 such townships in the 59 townships included in the sample. There was some decrease in the acreages of wheat, oats, and barley and increases in the acreages of rye and summerfallow during this period. The percentage of cultivated land, however, remained essentially the same.

Table 19.- Land Use in Sample Townships which Received Payments Every Year During 1945-49.

| Year      | Wheat | Oats | Barley | Rye | Summer-<br>fallow | Total<br>culti-<br>vated | Total<br>farmed | Per cent<br>culti-<br>vated |
|-----------|-------|------|--------|-----|-------------------|--------------------------|-----------------|-----------------------------|
| - acres - |       |      |        |     |                   |                          |                 |                             |
| 1945      | 165   | 37   | 23     | 21  | 126               | 382                      | 561             | 68.1                        |
| 1946      | 176   | 32   | 31     | 29  | 127               | 387                      | 560             | 69.1                        |
| 1947      | 156   | 27   | 30     | 45  | 114               | 386                      | 562             | 68.7                        |
| 1948      | 161   | 21   | 24     | 69  | 117               | 392                      | 562             | 69.8                        |
| 1949      | 159   | 19   | 17     | 40  | 168               | 412                      | 599             | 68.8                        |

Thus, with regard to the effect of the Act on resource allocation within farms, there is the likely tendency to increase the amount of submarginal land in cultivation on farms with less than 400 acres of cultivated land. This tendency probably exists only in areas where benefits are received often. To the extent that the increased

cultivated area is devoted to grain, malallocation of resources occurs. To the extent that the extra cultivated land is seeded to grass, increased productivity will occur. In view of the limited acreage seeded to grass in these areas it is considered that most of the increased acreage would be devoted to grain.

Consideration of the effect of the Act on resource allocation between farms and between agriculture and other segments of the economy involves examination of the relationship between income benefits under the Act and income from farms. The relation between income benefits and living expenses is also probably important in determining whether or not the farmer abandons his farm. None of these single relationships operates to the exclusion of the others in determining whether a farmer may move to another farming area or to another occupation. It is also difficult or impossible to determine the extent to which these relationships are considered by farmers in deciding whether or not they move from their present farms. Again, probable tendencies may be apparent. Tables 20, 21 and 22 present information on the size of Prairie Farm Assistance Act payments in relation to incomes and living expenses for the typical farms represented by the budgets.

Table 20.- Prairie Farm Assistance Act Payments as Percentage of  
Gross Farm Receipts Under Varying Conditions of Prices  
and Yields.

| Area and Farm<br>size                     | Price Level |         |         |
|-------------------------------------------|-------------|---------|---------|
|                                           | 1930-39     | 1939-49 | 1943-49 |
| average wheat yield of 2 bushels per acre |             |         |         |
| - per cent -                              |             |         |         |
| Prairie area:                             |             |         |         |
| $\frac{1}{2}$ section                     | 273         | 112     | 92      |
| 1 section                                 | 267         | 98      | 79      |
| $1\frac{1}{2}$ sections                   | 189         | 70      | 56      |
| Park area:                                |             |         |         |
| $\frac{1}{2}$ section                     | 99          | 35      | 27      |
| 1 section                                 | 131         | 42      | 35      |
| average wheat yield of 6 bushels per acre |             |         |         |
| - per cent -                              |             |         |         |
| Prairie area:                             |             |         |         |
| $\frac{1}{2}$ section                     | 43          | 21      | 16      |
| 1 section                                 | 37          | 17      | 13      |
| $1\frac{1}{2}$ sections                   | 26          | 12      | 9       |
| Park area:                                |             |         |         |
| $\frac{1}{2}$ section                     | 33          | 14      | 11      |
| 1 section                                 | 32          | 14      | 11      |



Table 21.- Prairie Farm Assistance Act Payments as a Percentage of  
Cash Living Expenses Under Varying Conditions of Prices  
and Yields

| Area and farm<br>size                     | Price Level |         |         |
|-------------------------------------------|-------------|---------|---------|
|                                           | 1930-39     | 1939-49 | 1943-49 |
| average wheat yield of 2 bushels per acre |             |         |         |
| - per cent -                              |             |         |         |
| Prairie area:                             |             |         |         |
| $\frac{1}{2}$ section                     | 37          | 29      | 27      |
| 1 section                                 | 58          | 46      | 43      |
| $1\frac{1}{2}$ sections                   | 58          | 46      | 43      |
| Park area:                                |             |         |         |
| $\frac{1}{2}$ section                     | 29          | 23      | 21      |
| 1 section                                 | 47          | 37      | 35      |
| average wheat yield of 6 bushels per acre |             |         |         |
| - per cent -                              |             |         |         |
| Prairie area:                             |             |         |         |
| $\frac{1}{2}$ section                     | 22          | 18      | 16      |
| 1 section                                 | 35          | 28      | 26      |
| $1\frac{1}{2}$ sections                   | 35          | 28      | 26      |
| Park area:                                |             |         |         |
| $\frac{1}{2}$ section                     | 19          | 14      | 12      |
| 1 section                                 | 28          | 22      | 21      |

Table 22.- Prairie Farm Assistance Act Payments and Returns to  
Capital and Operator's Labor under Varying Conditions  
of Prices and Yields.

| Area and farm<br>size                     | P.F.A.A.<br>payment | Returns to Capital and Operator's Labor |         |         |
|-------------------------------------------|---------------------|-----------------------------------------|---------|---------|
|                                           |                     | 1930-39                                 | 1939-49 | 1943-49 |
| average wheat yield of 2 bushels per acre |                     |                                         |         |         |
| - dollars -                               |                     |                                         |         |         |
| Prairie area:                             |                     |                                         |         |         |
| ½ section                                 | 317                 | -608                                    | -637    | -655    |
| 1 section                                 | 500                 | -956                                    | -879    | -882    |
| 1½ sections                               | 500                 | -1,219                                  | -1,094  | -1,083  |
| Park area:                                |                     |                                         |         |         |
| ½ section                                 | 250                 | -538                                    | -296    | -159    |
| 1 section                                 | 405                 | -1,021                                  | -724    | -658    |
| average wheat yield of 6 bushels per acre |                     |                                         |         |         |
| - dollars -                               |                     |                                         |         |         |
| Prairie area:                             |                     |                                         |         |         |
| ½ section                                 | 190                 | -381                                    | -102    | 47      |
| 1 section                                 | 300                 | -450                                    | 284     | 640     |
| 1½ sections                               | 300                 | -512                                    | 571     | 1,103   |
| Park area:                                |                     |                                         |         |         |
| ½ section                                 | 150                 | -428                                    | -5      | 234     |
| 1 section                                 | 243                 | -726                                    | -26     | 256     |

Table 20 shows that Prairie Farm Assistance Act payments are relatively large compared with gross farm receipts on the basis of a two bushels per acre wheat yield. The payments represent a greater proportion of total receipts for low price levels, small farms and for farms in the prairie area than for high price levels,

large farms and for farms in the park area. For the 1930-39 price level, the payment amounted to from 99 to 273 per cent of the gross farm receipts. It seems reasonable to expect that in areas where such benefits are received frequently it would provide a significant incentive for keeping people on their farms.

In the four to eight bushel category and except for the situation of low prices, the payments are not particularly large in relation to gross farm receipts. In instances of both yields, however, they are relative figures and although the payments are large in relation to gross farm receipts, the farm receipts themselves are small. In spite of the fact that the payments are nearly three times as large as farm receipts in some cases, they do not provide sufficient income to meet living expenses. Table 21 shows that in the zero to four bushel category, the payments provide up to 58 per cent of cash living expenses. Because living expenses were assumed to be the same for different sizes of farms in crop failure years, and since payments are smaller for a one-half section farm than larger ones, the percentage of cash living expenses covered by the payments is less for the smaller farms. The fact that from about one-third to somewhat over one-half of living expenses are covered by the payments would seem to provide a reasonably good incentive for keeping resources on the farms. The general proportion of about one-quarter in the four to eight category would not be as nearly as strong an incentive for retaining resources in their present use.

The substantial benefits in relation to farm receipts appear to be less significant when shown in relation to net farm returns as in Table 22. The return to capital and operator's labor is the return that the operator has for the work he has put into the farm plus the return on his invested capital, and it is the amount he would have for living expenses if the farm were free of debt. On the basis of the two bushel yield in the prairie area, the Prairie Farm Assistance Act payments not only provide nothing for living expenses over and above farm expenses but also do not in most cases remove any more than one-half of the negative net return. In the case of a six bushel yield, farm returns are high enough so that, except under conditions of low prices, the payments can be applied toward living expenses.

The reaction of farmers to reduced income in a crop failure year is different than that implied in the above tables. In some way receipts must equal expenditures. In the first place, living expenses will be reduced. Although the \$1,170 allowance on the basis of high prices is a modest one, it will be reduced of necessity, possibly by about 25 per cent. The allowance for cash farm expenses has already been reduced in the budgets taking into consideration the reduced expenses which would occur so that possibilities for further reduction in this item would be limited. When faced with a crop failure, however, farmers probably rely on short-term credit to provide them with some of the goods and services required to operate

their farms. Although information on the amount is not available, such credit might be forthcoming to the extent of one-half of their cash farm expenses.

Depreciation is a cost for which reserves are seldom actually set aside on an annual basis. In view of these probable adjustments in years of crop failure, Table 23 shows the relation between total receipts (farm receipts and Prairie Farm Assistance payments) to these reduced expenditures. This table shows that in periods of low prices it would be extremely difficult to make gross income meet cash obligations and that even with the Prairie Farm Assistance Act payments there would be a strong economic pressure in extended periods of crop failure for the farmer to move to another occupation or farming area. In a period when the intermediate or high level of prices prevail, the addition of crop failure payments to farm income brings the total to a level which will nearly meet the cash expense commitments. They would meet these cash requirements, if, in addition, farmers had modest reserves of assets which could be used. It seems likely, then, that except for the one-half section prairie farm and except for periods of low prices, the payment would be enough of an extra incentive to the farmers to remain on even poor farms if alternative opportunities were limited.

**Table 23.- Gross Receipts as a Percentage of Three-Quarters of Normal Cash Living Expenditures Plus One-Half Cash Farm Expenses.**

| Area and farm size                        | Price Level |         |         |
|-------------------------------------------|-------------|---------|---------|
|                                           | 1930-39     | 1939-49 | 1943-49 |
| average wheat yield of 2 bushels per acre |             |         |         |
| - per cent -                              |             |         |         |
| Prairie area:                             |             |         |         |
| $\frac{1}{2}$ section                     | 48.0        | 52.7    | 53.9    |
| 1 section                                 | 68.3        | 81.3    | 84.2    |
| $1\frac{1}{2}$ sections                   | 67.1        | 87.0    | 91.7    |
| Park area:                                |             |         |         |
| $\frac{1}{2}$ section                     | 54.8        | 83.1    | 95.1    |
| 1 section                                 | 69.7        | 103.3   | 109.8   |
| average wheat yield of 6 bushels per acre |             |         |         |
| - per cent -                              |             |         |         |
| Prairie area:                             |             |         |         |
| $\frac{1}{2}$ section                     | 66.1        | 93.4    | 105.0   |
| 1 section                                 | 104.3       | 160.9   | 183.4   |
| $1\frac{1}{2}$ sections                   | 118.2       | 192.9   | 221.7   |
| Park area:                                |             |         |         |
| $\frac{1}{2}$ section                     | 62.4        | 103.7   | 121.6   |
| 1 section                                 | 88.6        | 146.7   | 164.3   |

In the case of the six bushel yield, gross receipts are sufficient to meet the reduced requirements for living and cash farm expenses except for one-half section farms in the period of low prices. The payments, here then, might be considered sufficient to prevent some desirable population adjustment. In both cases the tendency for the program to maintain submarginal farms in their present form would only exist where benefits were received frequently.

The above tables indicate that even with the crop failure payments, farmers have considerable difficulty in meeting obligations. The program, therefore, would do little to remove the motives for risk aversion on the part of the farmer which were discussed in Chapter IV. It would still be necessary to undertake steps designed for survival rather than for maximum long run returns. The tables indicate also that gross returns in crop failure years are not adequate to allow payments on debt. The program would do little, then, to encourage the investment of capital within agriculture from outside sources. The payments themselves are exempt from laws relating to bankruptcy, insolvency, garnishment or attachment.

In summary, the effect of the program on the allocation of resources would seem to be these: there would be a tendency for the margin of cultivation to be extended in the case of farms with less than 400 acres under cultivation. There would be a tendency for the program to maintain people on farms which are subject to frequent benefits particularly in periods of medium or high prices. The fact that alternative opportunities are better in these periods makes this tendency less disturbing than it might otherwise be. Although the payments represent a relatively larger amount in relation to the farm business in periods of low prices, the net income (including payments) is so low that it is little incentive

for people to remain on poor farms. The fact that alternative opportunities in other occupations are limited may make the payments more significant in this regard than may at first be apparent. Also, the payments appear to be too small for the improvement of resource allocation, the malallocation of which are caused by risk aversion and capital rationing.



## VII. EFFECT OF THE PROGRAM IN STABILIZING FARM INCOME

### How Much Stability is Desired

It was indicated in Chapter IV that an insurance program should provide sufficient income in crop failure years so that the farmer is able to provide himself and his family with at least the basic essentials of food, shelter and clothing. This is the minimum requirement. Maximum stability would involve equal incomes from one year to another. There is a wide range in which some stabilizing could be considered to have taken place. Stability is, therefore, a relative concept and it is important to indicate first the degree of stability desired and then to determine the extent to which the provision of the Prairie Farm Assistance Act achieves this goal. A number of factors should be given consideration in the establishment of a stability goal. One of the most important of these is the amount of subsidy involved. A program involving large and continuing public subsidies can hardly be expected to provide much more than the minimum amount of stability. On the other hand, the stability goal in a program which involved no subsidy would be as high as the participants wished. It would depend on the amount of insurance that farmers considered that they could afford and wished to carry.

Since, however, subsidies are involved, consideration must also be given to the question of resource allocation. The goals should not

be too high in an agricultural economy in which there is to be much room for resource adjustment toward improved efficiency. In Saskatchewan more than 20,000 farms, or nearly 20 per cent of the total consist of only one-quarter section of land. More than 31,000 farms are one-half section in size. <sup>1/</sup> Most of the former and many of the latter can not be considered as operating near maximum efficiency. In addition, in the area covered by the economic classification of land, 2.6 million improved acres, 11.2 per cent of the total improved, are classified as submarginal and 6.4 million acres or 27.4 per cent are marginal for wheat production. <sup>2/</sup> There are less than one-half million acres of cultivated hay in the whole province which means that substantial amounts of poor land are still in grain production. The provision of a too high and stable income for these farmers would tend to prevent desirable adjustments from taking place. In view of the above and, as developed in the previous chapter, taking into consideration possibilities of reduced living expenses, availability of some credit and of some reserves, a somewhat arbitrary yet specific goal might be the provision of enough assistance so that the total income is sufficient to cover three-quarters of normal living expenses and one-half of the cash farm expenses.

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<sup>1/</sup> Census of Canada, Dominion Bureau of Statistics, Ottawa, Volume VI, Part II, 1951.

<sup>2/</sup> Unpublished data, Economics Division, Canada Department of Agriculture, Saskatoon, Saskatchewan.

### Amount of Stability Provided

Table 23 of the previous chapter gives a comparison of gross receipts with three-quarters of cash living expenses plus one-half of cash farm expenses. The table shows that under conditions of a two bushel yield and low prices, the program would fail to provide even this minimum of stability. With prices at the intermediate level, the stability goal is reached only for one section farms in the park area. In this case the livestock enterprise provides enough income so that this, together with the crop failure payment, is just large enough to meet the stability goal. It is possible that the reduced feed allowance for livestock would reduce these returns somewhat below those shown in the budgets so that even for the one section park farms it is questionable whether the minimum stability goal would be attained. In the case of the one-half section farms, the stability goal is one-half reached.

Under conditions of high prices, the one-half section farm has only a little more than one-half of the gross income required to meet the stability goal. Other farms more nearly approach it and the one section park area farm slightly exceeds it.

All of these comparisons are based on an average yield of two bushels of wheat per acre. In instances of complete crop failure, farmers would be in an even worse situation. There would probably be, however, more farms with a yield of more than two bushels per acre than less within the zero to four bushel category but the situation

would be serious for a considerable number of farms with no crop at all.

In the higher yield category the program meets the test more satisfactorily. The half section farms in the low price level period, however, still only meet two-thirds of the stability objective. Most of the other farms have some funds in addition to those required to meet the minimum stability goal. Although the program fails to provide what is considered to be the minimum stability goal, it should be made clear that the purpose of the Act is to assist agriculture and not necessarily to meet a specified proportion of necessary farm expenses. The point being made here is that if the stability goal were attained, the program would more adequately fulfil the welfare requirements and at the same time allow the maximization of returns to play a more important role as the goal of production organization with the consequent increased efficiency in the use of resources rather than the necessary maintenance of the "survival" goal with the consequent less efficient resource utilization.

In a supplementary way, the inadequacy of the payments in meeting expense commitments are further illustrated by referring to Tables 21 and 22 of the previous chapter. Table 21 shows the percentage of cash living expenses covered by the payments. In the two bushel category, the proportion of living expenses covered by the payment ranged from about one-fifth to about three-fifths. It is higher for larger farms and for lower prices. Table 22 shows that, with the two bushel

per acre wheat yield, the payments were large enough to wipe out the negative return only in the case of the one-half section park area farm with a level of high prices.

Further information, comparing the payments to expenditure commitments, is presented in Table 24.

Table 24.- Prairie Farm Assistance Act Payments as a Percentage of Cash Farm Expenses under Varying Conditions of Prices and Yields.

| Area and Farm<br>size                     | Price Level |         |         |
|-------------------------------------------|-------------|---------|---------|
|                                           | 1930-39     | 1939-49 | 1943-49 |
| average wheat yield of 2 bushels per acre |             |         |         |
| - per cent -                              |             |         |         |
| Prairie area:                             |             |         |         |
| $\frac{1}{2}$ section                     | 61          | 49      | 45      |
| 1 section                                 | 68          | 58      | 54      |
| $1\frac{1}{2}$ sections                   | 50          | 43      | 40      |
| Park area:                                |             |         |         |
| $\frac{1}{2}$ section                     | 45          | 37      | 34      |
| 1 section                                 | 47          | 40      | 37      |
| average wheat yield of 6 bushels per acre |             |         |         |
| - per cent -                              |             |         |         |
| Prairie area:                             |             |         |         |
| $\frac{1}{2}$ section                     | 31          | 25      | 23      |
| 1 section                                 | 35          | 30      | 28      |
| $1\frac{1}{2}$ sections                   | 25          | 22      | 20      |
| Park area:                                |             |         |         |
| $\frac{1}{2}$ section                     | 23          | 19      | 18      |
| 1 section                                 | 25          | 21      | 20      |

In the prairie area, payments as a percentage of cash farm expenses generally fall within the range of 40 to 60 per cent with a wheat yield of two bushels per acre. In the park area, the payments amount to from one-third to about one-half of these expenses. With a six bushel yield the proportion of cash farm expenses covered by the payments range from about one-fifth to one-third. These figures show further the relatively large proportion of expenses not covered by the Prairie Farm Assistance Act payments. Cash commitments would be larger than those indicated here if the farms had debt charges to pay. No allowance was made for these charges in the budgets.

Tables 21 (in the previous chapter) and 24 show that the payments cover a larger proportion of expenses in years of low prices than in years of high prices. Table 23, however, showed that taking gross receipts into consideration, the stability goal was more nearly reached in periods of high prices. Taking into consideration the fact that there are too many small farms and too many farms on sub-marginal land in agriculture, it would seem more appropriate to have the stability goal attained in periods of low prices and not attained in periods of high prices rather than the reverse. In periods of low prices, the general economic activity of the economy as a whole is usually low. There are few, if any, alternative opportunities for workers in agriculture. In periods of high prices, however, general economic activity is at a stepped-up pace and job opportunities are



more abundant. It is during this period that the desirable adjustments occur and care needs to be taken not to present obstacles to those adjustments. Although it might be argued that a crop failure to an efficient farmer is just as serious in a period of high prices as in a period of low prices, it is, nevertheless, true that there is more opportunity for alternative sources of income through custom work or off-farm jobs in periods when the economy is active. The absence of highly industrial areas in the west limits to some extent those opportunities but not entirely. These things must be given consideration in a program involving public subsidy.

In summary, it is seen that the payments under the Act are not adequate to cover what are considered to be minimum cash requirements when the yield of wheat is two bushels per acre. They would be even less adequate in years of complete crop failure. Successive years of crop failure would impose even more severe hardships on farmers even with the assistance of these payments. Not only would they have one-half of cash farm expenses and three-quarters living expenses to meet but the reserves and credit facilities, which were assumed to be available for the other half of the cash farm expenses in a single year, would become exhausted. In addition, allowances for depreciation could not be postponed indefinitely. Machines would either have to be replaced or else increased allowances made for repair expenses. The above relates largely to welfare considerations. To the extent that these requirements are not met, the stability requirements on



the basis of economic considerations are also not realized. It is not until organization for safety can be set aside and organization for long run maximum returns substituted in its place that the stability goal can be considered to have been achieved for the economic considerations involved.

### VIII. EFFECTIVENESS OF OPERATING MACHINERY

Previous chapters have dealt with the general or broad effects of the Prairie Farm Assistance program. This chapter is directed more particularly towards an examination of specific features of the Act for the purpose of determining their effectiveness in accomplishing what they were meant to do. In addition to the appraisal of the mechanics of operation, some of the features themselves will be examined to see how they fit into the framework of the model program established in Chapter IV.

#### Relation Between Actual Yields and Payment Categories

The Prairie Farm Assistance Act determines the category of payment to individuals on the basis of the average yield of wheat in a township or block. It is, therefore, possible for individual farmers to have yields outside of the category in which they are paid. Also, it is possible for individual farmers to have yields below eight bushels per acre and for the average of the township or block to be more than eight bushels per acre and, therefore, not receive payments. The extent to which actual yields do not correspond to payment categories depends on the variability of yields within the townships or blocks. Presumably, recognition of such variability resulted in the successive reductions in the size of area for which separate payment categories were established. When originally

established, the township (36 square miles) was the basis on which eligibility was determined. By 1950, the size of block was reduced to six square miles, and the block no longer had to be rectangular in shape.

In order to determine the relationship between yields and payment categories, the yields of individual farms were compared with the category in which they were paid. This was done for: 1) the farms in 59 sample townships for the period 1945-49. This group of townships consisted of those paid as full townships. No blocks within them were declared ineligible. 2) A group of seven townships which were paid under Section 7 (a) or (b) of the Act, that is, either an eligible block within an ineligible township was paid, or, an ineligible block within an eligible township was declared. These also covered the period 1945-49, and 3) a group of thirty townships paid under Section 7 (a) or (b) of the Act in 1950. A comparison of yields and payment categories in the first group would show, for those farmers receiving payment, how many had yields outside of the payment categories. It would not show anything about yields of those farmers not receiving payment. For this reason, townships paid under Section 7 (a) or (b) were selected and examined. In these, only some of the farmers were paid but records were available for all of them. These comprised groups 2 and 3. Group 2 covered the period 1945-49. Up to 1949, nine sections or one-quarter of the township, which had to be rectangular in shape, constituted the smallest block which could

be declared eligible in an otherwise ineligible township or which could be declared ineligible within an otherwise eligible township. In 1949, the size of the block was reduced to six sections (one-sixth of the township) and the requirement of rectangular shape was still in effect. In 1950, the Act was further amended so that the block no longer had to be rectangular in shape. The sections of land within the block had only to be contiguous. Table 25 shows the relation between actual yields and payment categories for the first group of townships. Within these townships there were no ineligible blocks.

In the prairie area, 37.8 per cent of the farms had yields between zero and four bushels per acre and were paid in that category. There were 27.8 per cent of the farms with yields between 4.1 and 8.0 bushels per acre who were paid in that category. Including the 3.1 per cent who were ineligible for various reasons, 68.7 per cent of the farms had average yields within the category in which they were paid. Of the 31.3 per cent of the farms which were paid other than in their actual yield category, 18.2 per cent had yields above, and 13.1 per cent had yields below the category in which they were paid.

Table 25.- Relation Between Wheat Yields and Categories of Payments  
5450 Farms, Complete Townships, Saskatchewan, 1945-49.

| Area and actual<br>yield | Number of<br>farms | Category of Payment |         |                         | Total |
|--------------------------|--------------------|---------------------|---------|-------------------------|-------|
|                          |                    | 0 - 4.0             | 4.1 - 8 | Ineligible <sup>1</sup> |       |
| - per cent of farms -    |                    |                     |         |                         |       |
| Prairie area:            |                    |                     |         |                         |       |
| 0- 4.0                   | 1,866              | 37.8                | 13.1    | 1.6                     | 52.5  |
| 4.1- 8.0                 | 1,338              | 8.9                 | 27.8    | 0.9                     | 37.6  |
| 8.1- 12.0                | 296                | 0.8                 | 7.1     | 0.4                     | 8.3   |
| 12.1- 16.0               | 42                 | 0.1                 | 0.9     | 0.1                     | 1.1   |
| 16.1 and over            | 17                 | 0.1                 | 0.3     | 0.1                     | 0.5   |
| Total                    | 3,559              | 47.7                | 49.2    | 3.1                     | 100.0 |
| Park area:               |                    |                     |         |                         |       |
| 0- 4.0                   | 626                | 23.3                | 21.4    | 1.0                     | 45.7  |
| 4.1- 8.0                 | 491                | 6.1                 | 29.3    | 0.4                     | 35.8  |
| 8.1- 12.0                | 184                | 0.6                 | 12.3    | 0.5                     | 13.4  |
| 12.1- 16.0               | 53                 | -                   | 3.7     | 0.1                     | 3.8   |
| 16.1 and over            | 17                 | -                   | 1.1     | 0.2                     | 1.3   |
| Total                    | 1,371              | 30.0                | 67.8    | 2.2                     | 100.0 |
| Both areas:              |                    |                     |         |                         |       |
| 0- 4.0                   | 2,492              | 33.7                | 15.4    | 1.4                     | 50.5  |
| 4.1- 8.0                 | 1,829              | 8.1                 | 28.2    | 0.8                     | 37.1  |
| 8.1- 12.0                | 480                | 0.7                 | 8.6     | 0.4                     | 9.7   |
| 12.1- 16.0               | 95                 | -                   | 1.8     | 0.1                     | 1.9   |
| 16.1 and over            | 34                 | 0.1                 | 0.6     | 0.1                     | 0.8   |
| No wheat                 | 302                | -                   | -       | -                       | -     |
| No information           | 218                | -                   | -       | -                       | -     |
| Total                    | 5,450              | 42.6                | 54.6    | 2.8                     | 100.0 |

1 Ineligible for payment because of non-residence, other occupation, too young, retired, no acreage in crops, insufficient acreage, estate, etc.



In the park area, 54.8 per cent had yields within the category in which they were paid. Of the 45.2 per cent with yields outside of their payment category, 23.8 per cent had yields above and 21.4 per cent had yields below the category in which they were paid. The average for both areas was 64.7 per cent for farms which were paid within their yield category and of the 35.3 per cent of the farms which were not paid in accordance with the individual yield category, 19.9 per cent had yields above the payment category and 15.4 per cent had yields below.

The second group of townships was a randomly selected group from those being paid as part townships, (under Section 7 (a) or (b) of the Act). Table 26 shows the relationship between actual yield and category of payment.

One-half of one per cent of the farms were paid at the rate of \$2.50 per acre (0 - 4.0 bushel category) who had yields of more than four bushels per acre. More than 12 per cent of the farms were paid in the 4.1 - 8.0 category (\$1.50 per acre) but actually had yields in the 0 - 4.0 category. Less than one-half of the farms which were paid in this category actually had yields within the same category. Nearly as many had yields of more than eight bushels per acre. Of the 32 per cent of all farms which were ineligible because the average yield of the block was too high, 7.3 per cent had actual yields of eight bushels or less, 1.4 per cent of them being four bushels or less. Thus, on the whole, the percentage of farmers who

had yields within the categories in which they were or were not paid would be 54.5. This includes the three per cent who were ineligible for a variety of reasons other than the average yield of the block being more than eight bushels per acre. Of the 45.5 per cent whose payment or non-payment did not correspond to the individual yield, 26.5 per cent were paid at a rate higher than their individual yields would have warranted and 19.5 per cent were paid at a rate lower than their individual yields would have warranted.

The third group of townships was selected from those that were paid under Section 7 (a) or (b) of the Act in 1950. In 1950 the requirement that the blocks must be rectangular in shape was dispensed with and this presumably would allow payments to follow more closely the pattern of individual yields. The relation between payment categories and actual yield categories is shown in Table 27.

Table 26.- Relation Between Actual Yield and Category of Payment, 1180 Farms, Part Townships, 1945-49.

| Actual Yield     | Category of Payment or Ineligibility |             |                           |                    | Total        |
|------------------|--------------------------------------|-------------|---------------------------|--------------------|--------------|
|                  | 0 - 4.0                              | 4.1 - 8.0   | 7 (a) or (b) <sup>1</sup> | Other <sup>2</sup> |              |
| bushels per acre | - per cent of farms -                |             |                           |                    |              |
| 0- 4.0           | 0.1                                  | 12.2        | 1.4                       | 0.6                | 14.3         |
| 4.1- 8.0         | 0.3                                  | 26.7        | 5.9                       | 0.9                | 33.8         |
| 8.1-12.0         | -                                    | 17.1        | 11.5                      | 0.8                | 29.4         |
| 12.1-16.0        | 0.1                                  | 6.0         | 7.8                       | 0.3                | 14.2         |
| 16.1 and over    | 0.1                                  | 2.4         | 5.4                       | 0.4                | 8.3          |
| <b>Total</b>     | <b>0.6</b>                           | <b>64.4</b> | <b>32.0</b>               | <b>3.0</b>         | <b>100.0</b> |

1 Ineligible for payment because the average yields for the blocks were more than eight.

2 Ineligible for payment because of non-residence, other occupation, too young, retired, no acreage in crops, insufficient acreage, estate, etc.



Table 27.- Relation Between Actual Yield and Category of Payment,  
992 Farms, Part Townships, 1950.

|                  | Category of Payment or Ineligibility |           |                           |                    |       |
|------------------|--------------------------------------|-----------|---------------------------|--------------------|-------|
| Actual Yield     | 0 - 4.0                              | 4.1 - 8.0 | 7 (a) or (b) <sup>1</sup> | Other <sup>2</sup> | Total |
| bushels per acre |                                      |           | - per cent of farms -     |                    |       |
| 0- 4.0           | -                                    | 9.0       | 0.6                       | 0.4                | 10.0  |
| 4.1- 8.0         | -                                    | 28.9      | 5.2                       | 0.7                | 34.8  |
| 8.1- 12.0        | -                                    | 17.6      | 12.2                      | 0.5                | 30.3  |
| 12.1- 16.0       | -                                    | 4.0       | 12.0                      | -                  | 16.0  |
| 16.1 and over    | -                                    | 1.9       | 6.8                       | 0.2                | 8.9   |
| Total            | -                                    | 61.4      | 36.8                      | 1.8                | 100.0 |

1 Ineligible for payment because the average yields for the blocks were more than eight.

2 Ineligible for payment because of non-residence, other occupation, too young, retired, no acreage in crops, insufficient acreage, estate, etc.

There was a closer relationship in this case between payment category and actual yield. Nearly twenty-nine per cent of the farms were paid in the 4.1 - 8.0 category and had yields in that category. Of the 36.8 per cent of the farms which were ineligible because the average yield for the block was too high, 5.8 per cent had individual yields of 8.0 or less. On the whole, 61.7 per cent of the farms were or were not paid in the category in which their individual yields fell. This included the 1.8 per cent who were ineligible for other reasons. Of the 38.3 per cent whose individual yields were outside the payment category in which they were placed, 14.8 per cent had yields below their payment category and 23.5 per cent had yields above the category in which they were paid.

There were very few payments in the 0 - 4.0 category for those townships paid under Section 7 (a) or (b). These are the townships in which a block within it has been made ineligible because of a higher than eight bushel yield or a block within it has been made eligible because of a lower than ten bushel yield. The average yield for the township would tend to be near eight bushels per acre and only in cases of very wide yield variability within townships would the average yield for a block fall into the 0 - 4.0 category.

The adequacy of area yields as an indicator of who should receive benefits can not be appraised entirely on the basis of the above relationships. In general, those relationships between payment categories and actual yields indicated that there were a large number of individuals whose yields were not in the payment category in which the township or block was placed.<sup>1/</sup> A number of reasons account for this. In the first place, there are always a number of isolated farms well above and well below the average in inherent productivity and in the managerial ability of the operator. It is a desirable feature of the Act that those whose yield is below the payment category for these reasons do not benefit. It is also a desirable feature of the Act that those with yields above the payment category for these reasons are not made ineligible.

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<sup>1/</sup> A parallel situation exists in areas of California where substantial variation in frost damage occurs within relatively small geographic areas. See Lee, Ivan M., Temperature Insurance - An Alternative to Frost Insurance in Citrus, Journal of Farm Economics, Volume XXV, No. 1, (February 1953), p. 18.

Secondly, some of the payments indicated in the tables were not for the whole farm. They may have been for land which was located in another township. If, for example, a farmer was located in an ineligible area and had a yield of more than eight bushels per acre, he may also have had land in an eligible township for which payment would have been made. He would then be placed in that payment category even though he did not receive payment for his whole farm. The number of cases where this occurs would be greater in those townships paid under Section 7 (a) or (b) than in those townships where all farms received payments. The area concerned in the former instance is smaller and there would be more likelihood of residents within a block having land outside that block than of residents within a township having land outside of that township.

A third reason explaining the non-relationship between payment categories and yield categories is that under Section 7 (a) of the Act, a block must have an average yield of more than ten bushels per acre to be declared ineligible for award. Thus, there would be farms with yields of more than eight bushels per acre but which, nevertheless, receive payment in the 4.1 - 8.0 bushel per acre category.

The fourth factor accounting for the non-relationship between payment category and individual yield category is that even among efficient and productive farms, variability in climatic factors gives rise to yield variability between farms even within small areas. To the extent that this factor contributes to a non-relationship between

payment and yield categories, the method of basing awards on an area yield basis is unsatisfactory. It would be difficult, if at all possible, to determine precisely the extent of this fourth factor. Although it is considerably less than the total non-relationship there is no doubt that in a number of cases injustices occur.

The relationship between payments and yield categories may be examined in another but more general way. The group of seven townships paid under Section 7 (a) or (b) between 1945 and 1949 was used for this analysis. All of the townships did not receive payments for each of the five years so that there are 29 township year observations. The standard deviation  $\frac{2}{\sqrt{}}$  was calculated for the individual yields within townships. The standard deviations of individual yields in the 29 townships ranged from 2.64 to 7.76 and averaged 4.49. The average wheat yields for the township ranged from 7.1 to 11.1 and for the whole group was 9.0. The coefficient of variation was 53.2 per cent. This is the extent of the variability in townships experiencing crop failure, or in other words, in townships where yields are relatively low. The variability of yields for all townships would be considerably higher. Since the standard deviation of yields is nearly five for farms whose average yield is nine, it is evident that basing awards on the basis of area yields will result in a large number of individuals being placed in categories outside of which their own yields lie.

$$\frac{2}{\sqrt{s}} = \frac{Sx^2}{n-1} \quad \text{where } Sx^2 = Sx^2 - \frac{(Sx)^2}{n}$$

### Wheat Yields as the Basis of Awards

Wheat yields were selected as the basis of award because wheat was the most important crop. There have developed, however, small local areas where other crops became important. In the Maple Creek area of Saskatchewan, for example, rye was commonly grown. In 1946-47, the price of rye was \$2.27 per bushel and in 1947-48 it was \$3.32 per bushel - more than double that of wheat. The use of wheat yields as an indicator of need seemed unrealistic. Also, brome grass seed production in the Unity area and alfalfa seed production in the White Fox area became important. In order to determine the extent to which other crops had replaced wheat as the most important crop, the acreages seeded to various crops were compared. In Saskatchewan in 1946, only about five per cent of the municipal districts had acreages of another crop exceeding that of wheat.<sup>3/</sup> In most or all of these, wheat remained the most important crop for sale. In only one municipality out of about 350 did the rye acreage exceed that of wheat. Furthermore, the price of rye declined rapidly below that of wheat so as to make its advantage in that respect non-existent.

In Alberta and in the same year, nearly one-third of the municipal divisions had the wheat acreage exceeded by that of another crop. A large number of these, however, were Improvement Districts which were

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<sup>3/</sup> Census of Prairie Provinces, Dominion Bureau of Statistics, Ottawa, 1946, Volume IV.

not developed to a great extent and the total cultivated acreage in them was small. In Manitoba, more than one-third of the municipal divisions had the wheat acreage exceeded by some other crop. Again, however, most of these were undeveloped areas where the total cultivated acreage was small. Furthermore, various farm management and land utilization studies in the prairies have indicated the primary importance of wheat in the individual farm businesses. Accordingly, it is considered appropriate that the yield of wheat be used as the indicator of benefit needs.

There is a provision in the regulations by which the yield of other crops will be used if there is no wheat grown in the township. In such an instance the yield of wheat shall be considered two-thirds of that of oats or barley or equal to that of rye. The relationship established between wheat yields and that of oats and barley in Chapter VI would indicate, however, that about 55 per cent of the yield of oats and about 70 per cent of the yield of barley would be more appropriate bases of determination.

#### Yield Information

There is no method by which a precise check can be made on the accuracy of the yield information obtained by Prairie Farm Assistance inspectors. Inspectors visit each farm in order to get a record of yield. However, in spite of this care and caution it is possible that farmers may tend to give biased yield estimates. They would not want to overestimate their yields and in avoiding that there may be

a tendency to understate the yield.

Two general checks are possible on the Prairie Farm Assistance Act yield estimates. The first is a comparison of yields obtained by the Saskatchewan Secretary of Statistics with those obtained by the program's inspectors. The Provincial Statistics Branch through numerous crop reporters and elevator agents compiles an estimate each year of the average yield of grain for each municipality. These estimates were compared with those arrived at by the Prairie Farm Assistance Act administration. Only those municipalities were compared where payments were made to all townships in the particular year. A summary of these comparisons appears in Table 28. Each year there was more than a one bushel per acre difference and the average difference for the five year period was 1.2.

Table 28.- Comparison of Wheat Yields Obtained by Saskatchewan Statistics Branch and by the Prairie Farm Assistance Act, Selected Municipalities, Saskatchewan, 1945-49.

| <u>Year</u>          | <u>Number of<br/>rural muni-<br/>cipalities</u> | <u>Secretary<br/>of<br/>Statistics</u> | <u>P.F.A.A.</u> | <u>Difference</u> |
|----------------------|-------------------------------------------------|----------------------------------------|-----------------|-------------------|
| - bushels per acre - |                                                 |                                        |                 |                   |
| 1945                 | 23                                              | 5.00                                   | 3.95            | 1.05              |
| 1946                 | 25                                              | 7.96                                   | 6.77            | 1.19              |
| 1947                 | 21                                              | 6.57                                   | 5.44            | 1.13              |
| 1948                 | 14                                              | 6.50                                   | 5.36            | 1.14              |
| 1949                 | 17                                              | 7.13                                   | 5.65            | 1.47              |

The second general check which can be made is by the use of individual yield records obtained in farm business studies. The estimates obtained in these studies have the disadvantage of being subject to memory bias. During the course of enumeration, the farmer was asked to recall wheat yields for a previous number of years. Although a high degree of uniformity and consistency has been obtained in this type of yield estimate, they are not as likely to be as accurate as a current estimate. In fifteen municipalities it was possible to find 135 farmers who had provided yield estimates to both sources. The average wheat yield obtained by the Prairie Farm Assistance Act for these farms was 5.4 bushels per acre and the average yield obtained for the same farms and for the same years in farm business studies was 6.0 bushels, a difference of 0.6 bushels.

These checks show that there may be a tendency for estimates obtained by the Prairie Farm Assistance Act to be biased downward. The checks are only evidence and cannot be proof of it since the method of obtaining yields in the checks is less rigorous and exacting than the method employed by the Prairie Farm Assistance Act. However, the estimates obtained in what has been used as checks may be less subject to downward bias than estimates obtained for the purpose of determining benefits.

The difference obtained in the Prairie Farm Assistance Act estimates and those from other sources were subjected to statistical tests of significance. The test was to find the significance of



differences in the means of related measures. Since the two estimates are not of independent samples, the test of significance for the difference in the means of independent samples would not apply.

The formula used was:

$$t^1 = \frac{\bar{d}}{s} (n - 1)^{\frac{1}{2}}$$
, where  $\bar{d}$  is the mean of the differences,  $s$  is the standard deviation of the difference and  $n$  is the number of observations. The values of the test and the corresponding critical values at the one per cent level are shown in Table 29. The table shows that the differences obtained were very unlikely to have occurred by chance. In repeated tests of this kind, differences as large as these would occur less than once in a hundred times due to chance alone.

Table 29.-Tests of Significance between Estimates of Yields by the Prairie Farm Assistance Act and Those by Other Agencies

| Source of Estimate                   | Year    | Size of Sample | Degrees of Freedom | $t^1$               | 1% level |
|--------------------------------------|---------|----------------|--------------------|---------------------|----------|
| P.F.A.A. and Farm Management Studies | 1946-49 | 135            | 134                | 3.425 <sup>xx</sup> | 2.576    |
| P.F.A.A. and Statistics Branch       | 1945    | 23             | 22                 | 4.104 <sup>xx</sup> | 2.831    |
|                                      | 1946    | 25             | 24                 | 5.087 <sup>xx</sup> | 2.797    |
|                                      | 1947    | 21             | 20                 | 4.779 <sup>xx</sup> | 2.845    |
|                                      | 1948    | 14             | 13                 | 4.856 <sup>xx</sup> | 3.012    |
|                                      | 1949    | 17             | 16                 | 5.065 <sup>xx</sup> | 2.921    |

xx Significant at the one per cent level.

In order to determine the significance of minor differences in yield, one bushel per acre was added to the average yield in each of the 59 sample townships. In so doing, the category of 28.3 per cent

of the townships were changed. Nearly 16 per cent of the townships were changed from the 0 - 4.0 payment category to the 4.1 - 8.0 category and 12.4 per cent were changed from the 4.1 - 8.0 category to an ineligible one. By adding only one-half bushels to the average yield, 20 per cent of the categories were changed. These changes were about equal in the change from 0 - 4.0 to 4.1 - 8.0 and from 4.1 - 8.0 to the ineligible one. Thus, a minor error in yield estimate makes a large difference in the classification of benefits.

#### Maximum Awards

The Act provides that the maximum cultivated acreage on which awards will be made is 400. Many farmers, of course, have cultivated acreages in excess of this amount so that they receive no benefits for the acreage in excess of 400. It would be to the advantage of large farms, as far as benefits are concerned, to legally divide the farm in two. In order for a farmer's son to qualify as a separate farmer he must have a written lease from his father. Thus, it is possible for two types of farm units to develop a "legal" one and an "economic" one. An economic farm unit is one which is operated from the same farmstead and for which essentially the same equipment is used, regardless of the formal or informal leasing arrangements between the members of the family. Legal farm units are defined as those separated by formal leases or ownerships. From various farm business studies it has been possible to compare economic farm units with those as used by the Prairie Farm Assistance Act in establishing

awards. Table 30 shows the differences in the two kinds of units. Comparisons were possible in 17 townships with 410 farms. There were nearly seven per cent more legal farms than economic farms. The total payment to all farms was \$115,610. If payments were made to farms on the basis of the economic definition, the payments would have been \$6,076 or 5.3 per cent less. It is not possible to determine how many of these extra farms were organized for the purpose of obtaining extra benefits under the Act. The leasing or renting of land by a son is a common method by which sons get started in farming. There is no doubt that this was the reason for at least some of the differences noted above.

Table 30.-Comparison of Numbers of Farms as Listed by the Prairie Farm Assistance Act and by Farm Business Studies, 17 Townships, 1946-49.

| Payment category | Number of farms |          | Difference |          |
|------------------|-----------------|----------|------------|----------|
|                  | Legal           | Economic | Number     | Per cent |
| 0 - 4.0          | 138             | 129      | 9          | 7.0      |
| 4.1 - 8.0        | 272             | 255      | 17         | 6.7      |
| Total            | 410             | 384      | 26         | 6.8      |

#### Eligibility for Participation in the Program

The one per cent levy is made on all grain sold to grain elevators, licensed dealers, and so on, except grain grown by Indians on farm lands within Indian Reservations. However, everyone who pays the levy is not eligible to receive benefits. If farming is not the main

occupation, or if the operator does not live in the area from the first of May until the end of the crop season, he is not eligible for award. There would seem to be no justification, except for ease of administration, for automatically excluding anyone from possible benefits who contributes in the form of the levy. They not only contribute through general taxes, as do all taxpayers, but in addition they are forced to make an additional contribution in the form of the one per cent levy without having the opportunity of benefiting.

#### Definition of Grains

The levy is made on what is defined as grain - wheat, oats, barley and rye. These are generally the most important crops in Western Canada. Flax is another important crop but the one per cent levy is not made on it. About 280 million dollars of flaxseed was produced during the period 1939-49 compared to about 138 million dollars of rye.<sup>4/</sup> Since the growers of flax obtain benefits as well as those of other grains it would seem that the levy should be collected on flax as well. Nearly three million more dollars would have been collected in levies during this period if the levy had been made on flax.

#### Price Policy Feature

The program states that when the price of wheat falls below 80 cents per bushel, payments to farmers shall be made in the 8.1-12.0

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<sup>4/</sup> Handbook of Agricultural Statistics, op.cit., pp.46 and 54.

bushels per acre yield category. These payments shall be made at the rate of ten cents per acre for each cent not exceeding ten by which the average price is below 80 cents per bushel. Thus, up to one dollar per acre can be paid on one -half of the cultivated acreage. The maximum payment in this category is \$200. The maximum payment to farmers in a 4.1 - 8.0 category under similar circumstances is \$300 and the maximum payment in the 0 - 4.0 category is \$500.

There would appear to be an unwarranted inconsistency with respect to this price feature. Rates of payment are established for townships or blocks with a yield below eight bushels per acre regardless of price. These presumably are to partially offset the reduced income during this period. As the price drops below 80 cents per bushel, farms with a yield of 8.1 - 12.0 bushels per acre get a special consideration because of reduced income resulting from falling prices and yields. Farms with lower yields receive no extra payment because they too have prices below 80 cents per bushel. The income position of farmers with yields below eight bushels per acre would be much worse on the average even taking into consideration their somewhat larger benefits under the Act, than those in the 8.1 - 12.0 bushel per acre category. It would, therefore, appear that if it was considered desirable to incorporate the price feature into the Act that its benefits should also apply to those who suffer a more complete crop failure.

## IX. A CONSIDERATION OF ALTERNATIVES

Among the possible alternatives to the Prairie Farm Assistance Act as it currently operates, three alternatives will be discussed. These are:

(1) Dispense with the Act and allow relief together with individual action to assume responsibility for problems arising out of crop failure.

(2) Dispense with the Act and institute a program of self-supporting crop insurance, and

(3) Continue within the general framework of the Act and incorporate what appears to be desirable adjustments.

### Provision of Relief

Until 1939 when the Prairie Farm Assistance Act came into being, relief was the principal means by which assistance was provided in years of crop failure. In Saskatchewan, relief service advances amounted to about 5.5 million dollars between 1918 and 1930.<sup>1/</sup> From 1930 to 1939 they amounted to 143.2 million dollars. In addition, relief roadwork and other relief services from 1929-30 to 1938-39 amounted to 25.4 million dollars. Thus, the total relief for the

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<sup>1/</sup> The years were indicated as "relief seasons" so that the periods may be more appropriately considered as being from the mid-points of the respective years.

period 1930 to 1939 amounted to about 168 million dollars.<sup>2/</sup>

In comparison, calculations have been made on what would have been paid under the Prairie Farm Assistance Act in Saskatchewan if it had been in operation during this period.<sup>3/</sup> The calculations were made on the basis of municipal average yields and were based on the Act as it operated in 1941. The estimates could be considered as only rough approximations of what the current Act would have paid in those years. According to these estimates, 24.9 and 154.9 million dollars would have been paid for the periods 1918-1929 and 1930-38, respectively. The one per cent levy on marketed grains would have been 25.2 million dollars in the 1918-1929 period and 6.1 million dollars in the 1930-1938 period. Thus, the first period would have provided a surplus of 0.3 million dollars and the second period would have resulted in a cost to the public treasury of 148.8 million dollars. These figures cannot be used as comparative costs with those of relief. Some of the relief advances were repaid. The relief advances, however, were greater than the public cost of the Prairie Farm Assistance Act would have been.

A more important difference in the two types of programs lies in the nature and extent of benefits. Relief is considered an undesirable method of handling general hardships caused by crop failure. Many

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<sup>2/</sup> Memorandum from the Saskatchewan Land Utilization Board to the Director of the Prairie Farm Rehabilitation Administration, Regina, mimeograph report, December 29, 1942, p. 4.

<sup>3/</sup> Ibid., p. 14.

who need assistance may be reluctant to accept it on this basis while others in less dire circumstances would accept relief simply because it is available. The program of the Prairie Farm Assistance Act, however, makes payments on standard or fixed basis and there is no stigma attached to their acceptance. This is no doubt due, in a large part, to the fact that farmers contribute a significant amount into the fund and the benefits can then even be considered by farmers as a claim.

The absence of the Act would likely bring about a more rapid adjustment in the use of resources. Submarginal land used for grain and very small inefficient farms would be abandoned sooner in the absence of the Act. These adjustments would not occur, however, without considerable hardship. Society has assumed the moral and economic responsibility of preventing needless and severe privation and, therefore, does not insist upon rapid and painful adjustments.

Accordingly, the reliance on relief programs to alleviate the conditions caused by crop failure is considered as unsatisfactory. Relief provides little security, it is poor for morale and it is also not equitable. The program of the Prairie Farm Assistance Act is considered superior to a program based on relief.

#### Self-Supporting Crop Insurance

The second suggested alternative to the current program of the Act is the institution of a plan of self-supporting crop insurance. Reference to observations on the Federal Crop Insurance Program in the United States were made in Chapter IV. In view of the experience



in the United States with crop insurance programs, a review of some of these activities will be given.

The first attempt at providing crop insurance by a private company was made in 1899.<sup>4/</sup> Additional attempts were made in 1917, 1919-1923, 1931 and 1937-38. All of these efforts failed. Some of the policies covered both yield and price, and there were not sufficient reserves to carry the heavy losses that were experienced. The premium rates in some cases were too low. The companies had insufficient data on which to establish premium and indemnity rates. Adverse selectivity was a major weakness. Policies were concentrated and in many cases policies were written after it was evident that a crop failure would occur. Finally, there was evidence, in some cases, of mismanagement and inexperience with insurance and agricultural problems.

The Federal government entered the field of crop insurance in 1938. The subject of crop insurance had been almost continuously before Congress and the Department of Agriculture for twenty years previously. After the series of severe droughts after 1930, President Roosevelt set up a committee on crop insurance to study and make recommendations with the "... advice and assistance of national farm organization leaders so that the plans can be submitted to

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<sup>4/</sup> Buckler, James L., All Risk Crop Insurance, A Thesis Submitted to George Washington University, Federal Crop Insurance Corporation, United States Department of Agriculture, 1950, pp.3-7.

Congress with the approval and support of the representatives of the farmers". <sup>5/</sup> The Federal Crop Insurance Corporation was established in 1938 in accordance with Title 5 of the Agricultural Adjustment Act and within the Department of Agriculture. Its purpose was " ... to promote the national welfare by alleviating the economic distress caused by wheat-crop failures due to drought and other causes, by maintaining the purchasing power of farmers, and by providing for stable supplies of wheat for domestic consumption and the orderly flow thereof in interstate commerce." <sup>6/</sup>

The Federal Crop Insurance Corporation first provided insurance on wheat. Cotton was added in 1942. The first five years' experience resulted in losses each year due to bad weather and adverse selectivity. A controversial move was taken by Congress in 1944 when the Corporation's activities were suspended because of the heavy losses. A general demand for resumption of activities resulted in a modified program in 1945. The next two years resulted in profit on wheat, a break-even on flax, a slight loss on corn and heavy losses on cotton. The heavy losses on cotton resulted in a further examination of the program and resultant modifications. The number of counties in which insurance could be undertaken was limited. In succeeding years, a favorable premium-indemnity ratio was experienced and the size of the program grew. In 1948, 375 counties were provided with insurance.

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<sup>5/</sup> Report and Recommendations of the President's Committee on Crop Insurance, Washington, D.C., December 1936, Letter of transmittal.

<sup>6/</sup> Buckler, James L., op.cit., p. 11.

These increased to 394 in 1949, 624 in 1950, 810 in 1951 and 874 in 1952.<sup>7/</sup>

The Federal Crop Insurance Corporation has advanced far in establishing realistic premium-indemnity rates. Available data are used in determining premium rates for counties. In addition, substantial discounts are given in areas where surpluses have been established or where a series of years without crop failure has occurred.<sup>8/</sup> One serious drawback, however, is the limited participation. In the case of wheat in 1950, only 21 per cent of the eligible farmers were insured.<sup>9/</sup> For this reason, several writers have concluded that the program has failed.<sup>10/</sup> The fact that in addition to low overall participation, participation is lowest in high risk areas and highest in low risk areas would seem to indicate that high participation would be very difficult if at all possible to achieve. The continued growth and activity of the Corporation, however, still holds hope for success.

The yield variability in the high risk areas of the Great Plains in the United States is similar to that in a large part of the prairie provinces. It is likely that the characteristics of low participation would prevail in this part of Canada as it does in the United States

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<sup>7/</sup> Agricultural Finance Review, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D.C., November 1952, p. 74.

<sup>8/</sup> Wheat Crop Insurance for 1951, Federal Crop Insurance Corporation, Washington, D.C., January 9, 1950, p. 3.

<sup>9/</sup> Report to Congress, Federal Crop Insurance Corporation, United States Department of Agriculture, 1950.

<sup>10/</sup> See Chapter IV.

if the program were on a voluntary basis. Since participation would be low and since it would be confined largely to areas where the need for protection is less, it is considered that the means of alleviating distress brought about by crop failure can be better provided within the general framework of the Prairie Farm Assistance Act. Although the benefits under the Act are very modest, the extreme variability of yields makes it doubtful whether farmers can afford to insure for a high level of benefits. Provision of basic needs is probably the most that can be expected. In time, as farms become larger, as sub-marginal land reverts to its optimum use and as farms advance to a sounder financial position, farmers will be in a better position to carry more complete crop failure protection. The ultimate goal, then, may be considered to be one of self-supporting crop insurance which provides protection to the large majority of farmers. Progress towards its attainment is gradual, by either the method in the United States through expansion of the current program or by the method in western Canada through adapting the Prairie Farm Assistance Act to insurance principles. In western Canada, there would be a considerable advantage in using the already existing institution for the attainment of this goal.

#### Adaptations Within the General Framework of the Act

Chapters V to VIII inclusive set forth a number of ways in which the Act failed to meet the test of the model program established in Chapter IV. The introduction of certain changes would do much to

bring the program more in line with that model. The discussion relating to levy-benefit rates, stability, and to some extent that relating to resource allocation is based on information obtained in the sample of 59 townships in Saskatchewan. The results obtained in the preceding chapters relate, therefore, to the population from which the sample was selected. The proposed changes are, however, of a general rather than precise nature. Since the prairie and park areas of Saskatchewan are part of a regional rather than provincial soil zone pattern and because of the general nature of the proposals it is considered that they have relevancy for the Act as a whole.

The program involves, first of all, a considerable cost to the central treasury. Less than one-half of the benefits are covered by the one per cent levy. Adjustments should be made in the levy to bring the funds raised in this way more nearly equal to the benefits paid to farmers. The extent to which this equalization should take place depends to some extent upon what the farmers can afford. Welfare considerations would dictate that the process should not be too rapid. Consideration should also be given to tariff concessions, subsidies and other advantages enjoyed by various segments of the economy in a decision as to how far the equalization of premiums and benefits should go. From the standpoint of economic justice and also from the standpoint of placing the program on a more secure and permanent basis, however, there would seem to be justification for expecting the program to pay more of its own way.

In addition to the considerable subsidy involved, the program is actuarially unsound from the standpoint of risk classification. Instead of low risk areas having smaller premiums to pay, they pay much higher premiums. The figures on pages 77, 78 and 79 show the relative amounts of benefits received in the different areas of the prairie provinces. Table 17 shows the levy-payment ratio for various benefit categories. These then, would serve as a basis for establishing levy or premium rates in line with the risk involved. It would not be desirable to equalize levy and benefits for all categories suddenly. In the case of townships with an index of 90 and over, this would mean taking more than 80 per cent of the crop to pay for the benefits. As an initial step the levy might be set at a somewhat arbitrary figure of ten per cent for high risk areas and range down to one per cent for low risk areas. Taking into consideration the apparent tendency indicated in Chapter VIII toward biased estimates of yield, further provision might be made for flexibility in the levy rates depending on benefit experience. This provision might be in the form of discounts after a series of years with no benefits or it might be in the form of an additional levy of one-half or one per cent for each year that benefits are received, or both provisions might be incorporated. Provisions such as these would tend to reduce the desirability of obtaining benefits and, therefore, also reduce the bias in yield estimates which apparently exists. More importantly, such provisions would allow a somewhat automatic adjustment

between levy and benefit. The adjustment in rates would be gradual and would not involve as severe hardships as a sudden upward adjustment in levy rates.

The question of resource allocation is related first of all to the subsidies or actuarial weakness of the program and secondly to the degree of stability provided. A general increase in the levy, particularly in high risk areas, would partly remove the cause of misallocated resources. Since it is not possible to increase the levy to an amount equal to the benefits it may also be desirable to place restrictions on benefits in areas which are obviously submarginal. The land classification maps covering about 47 million acres in the west would be a basis for isolating these areas. Benefits to these areas may also be made contingent upon a certain proportion of the submarginal land seeded to grass. However, the gradual adjustment in the levy rate in accordance with risks involved would slowly and automatically produce desired adjustments in resource use.

The second aspect of resource allocation, that related to stability, is concerned with risk aversion and capital rationing. Chapter VII indicated that sufficient stability was not provided to remove risk aversion on the part of the farmer and capital rationing on the part of the lenders. To improve resource allocation from this standpoint, greater income stability must be provided.

Chapter VII indicated too that benefits under the Act were not adequate to meet what had been established as minimum stability requirements. Farmers were much better off under conditions of a six bushel wheat yield with smaller benefits than with a two bushel wheat yield with the larger benefits. Generally, with a six bushel wheat yield the minimum stability requirements were met.

For farms having a two bushel per acre wheat yield, the additional payments required in order to increase gross receipts to a level which would meet the minimum stability requirements are shown in Table 31.

Table 31.-Additional Per Acre Payments Necessary to Meet Requirements of Minimum Stability

| Area and<br>Size of Farm | Price Level |         |         |
|--------------------------|-------------|---------|---------|
|                          | 1930-39     | 1939-49 | 1943-49 |
| - dollars per acre -     |             |         |         |
| Prairie area:            |             |         |         |
| $\frac{1}{2}$ section    | 3.70        | 4.24    | 4.46    |
| 1 section                | 1.60        | 1.16    | 0.90    |
| $1\frac{1}{2}$ sections  | 0.94        | 0.45    | 0.31    |
| Park area:               |             |         |         |
| $\frac{1}{2}$ section    | 4.16        | 1.96    | 0.60    |
| 1 section                | 1.68        | -0.22   | -0.72   |

The figures are calculated on the basis of a maximum eligible acreage of 400 and of payments being made on one-half of the cultivated acreage.

The figures show that there is a considerable range between sizes of farms in additional payments required. This is mainly



because of the higher per acre overhead living costs on the smaller farms. It would not be possible to select one rate which would meet the requirements in all cases. The use of a single rate would more closely meet the requirements in the majority of cases if the payments were made on the basis of a maximum eligible acreage of 250 or 300. Table 32 shows the additional per acre requirements if the original and the additional payments were made on the basis of a maximum eligible acreage of 250. They are based on the assumption that payments are made on one-half of the eligible acreage and that the average yield is two bushels per acre. On this basis, an additional payment of about \$3.50 per acre in the prairie area would be the intermediate rate for the various farm sizes and price levels. This would be a total payment of six dollars per acre on one-half of a maximum of 250 acres. The maximum payment per farm on this basis would be \$750. The per acre requirement for the minimum stability level in the park area range from \$4.16 to -\$0.38 depending on size of farm and price level. The intermediate rate in this case would be about two dollars. For the purpose of uniformity and in view of the relation between levies and payments the additional rate of payment in this area might also be established at \$3.50.

An alternative approach in providing the minimum stability level of income in years when the yield falls below four bushels per acre would be to provide a fixed sum regardless of farm size and then an additional amount on an acreage basis. This would appear to have merit in that a minimum stability level of income includes a

relatively fixed amount, regardless of farm size, for living expenses and a variable amount relating to the variable expenses associated with different farm sizes.

Table 32.- Additional Per Acre Payments Necessary to Meet Requirements of Minimum Stability, Based on Maximum Eligible Acreage of 250.

| Area and Size<br>of farm | Price Level |         |         |
|--------------------------|-------------|---------|---------|
|                          | 1930-39     | 1939-49 | 1943-49 |
| - dollars per acre -     |             |         |         |
| Prairie area:            |             |         |         |
| $\frac{1}{2}$ section    | 3.83        | 4.38    | 4.61    |
| 1 section                | 4.06        | 3.37    | 3.21    |
| $1\frac{1}{2}$ sections  | 4.50        | 2.95    | 2.50    |
| Park area:               |             |         |         |
| $\frac{1}{2}$ section    | 4.16        | 1.96    | 0.60    |
| 1 section                | 3.33        | 0.40    | -0.38   |

An advance in the rate of benefit is necessary from the welfare consideration of providing basic needs and from the economic standpoint of allowing farmers to plan and organize their operations in an atmosphere of improved stability and security. The increased benefits raises the question of resource allocation again in that the increased benefits may keep submarginal farms in operation. Several factors would tend to prevent this from happening. These are the proposed restrictions of benefits in submarginal areas, the proposed increase in the levy and the determination of benefits on the basis of area yield.

It was indicated in Chapter VIII that certain classes of people were not eligible to receive awards even though they had to

contribute one per cent of their crop sales. In view of the proposed increase in the levy, a change should be made regarding the status of the group. Either they should be allowed to participate or they should not be required to contribute to the fund in the form of the levy. As the Act stands, they pay a double tax.

The exclusion of flax in the definition of grain does not appear to be warranted. Since benefits are paid on acreages devoted to flax, the levy should apply to this crop as well.

The price policy feature of the Act appeared to be inconsistent. Payments under this section of the Act should either be made in all categories or not at all. If levies can be increased sufficiently to cover the costs in providing this measure of security, the price feature may well be incorporated into the Act. In view of the subsidies involved in the program and in view of the fact that farmers in lower yield categories are in greater need of assistance than those in the 8 - 12 bushels per acre category, there are substantial reasons for eliminating this category.

In summary, it is concluded that the provision of crop failure assistance in the form of relief is much less desirable than by a system of contributory crop insurance as operated under the Prairie Farm Assistance Act. The immediate establishment of a completely self-supporting crop insurance system would not be workable. Premium rates would be so high that those who most need insurance could not afford it. Progress toward self-supporting crop insurance could be made within the general framework of the Prairie Farm Assistance Act

by incorporating certain changes. In addition to progress towards self-support, the Act would, at the same time, provide a greater degree of stability to high risk farming areas and would have a more equitable provision for the collection of levies or premiums. These changes include: increasing levies more in line with risks involved; increasing benefits to provide a greater degree of stability; have conditional benefits to farms in submarginal areas; either include or exclude "non-farmer" groups with respect to both levies and benefits; collect a levy on flax and either have the price provision apply to all categories or none at all.

As an initial and practical step, a committee might be established to study and submit a specific plan for crop insurance. In view of the general support required for the successful operation of the plan, instructions to such a committee might include a section similar to that included in the President's instructions to the Committee on Crop Insurance in the United States in that leaders of farm organizations be consulted "... so that the plans may be submitted to Congress (Parliament) with the approval and support of the representatives of the farmers."

## X. SUMMARY AND CONCLUSIONS

The Prairie Farm Assistance Act Program was established in 1939 to assist agriculture in western Canada. It followed a period of extremely unfavorable conditions during which farmers and local governments were unable to successfully cope with the problems associated with a succession of crop failures and low prices. The program provided for payments to farmers of a maximum of \$500 when the yield of wheat was determined to be zero to four bushels per acre and a maximum of \$300 when the yield was more than four but not more than eight bushels per acre. The yields were determined on an area basis, the size of area ranging from six to 36 square miles. A levy of one per cent was made on sales of grain through commercial channels and the money so raised was available for the payment of benefits. Additional funds required were obtained from the central treasury. Up to and including the crop year 1951-52, more than 143 million dollars were paid to farmers under the Act. Collections under the one per cent levy amounted to 64.3 million dollars.

The program has features of both crop insurance and assistance. The collection of the levy on grain sales together with the payment of awards conditional upon crop failure is an insurance feature. The payment of substantial amounts from the Federal treasury is assistance. The program has been operating long enough to offer

opportunity for study of its accomplishments, shortcomings and potentialities.

A sound crop insurance system offers substantial advantages. It provides stability of income and improved resource allocation. Stability is important from the standpoint of welfare in that farmers have a source of income in crop failure years which is sufficient to meet pressing expenses. It is important from the standpoint of efficient production in that organizational plans can be formulated on the basis of obtaining maximum long run returns rather than on the basis of providing some income in crop failure years.

The program of the Prairie Farm Assistance Act was found to be lacking some of the important requirements of a sound crop insurance program. Even under the relatively favorable crop conditions prevailing between 1939 and 1949 substantial subsidies were involved. A program involving a smaller proportion of subsidies would be desirable from the standpoint of having a more secure and possibly more permanent organization. It would also be desirable from the standpoint of obtaining optimum resource allocation and of providing economic justice.

In addition to the requirement of a considerable subsidy, the program's levies between farms were not related to the risks involved. In fact, the levies or premiums were inversely related to the benefits. Townships which had received 90 per cent or more of maximum benefits paid only a little more than one dollar for every

one hundred dollars in benefits received. At the same time, those townships in the prairie area which had received one to 29 per cent of maximum possible benefits paid \$85 for every \$100 received in benefits. Other townships have paid even more into the Fund in levies but have received no benefits.

With regard to resource allocation, the program does not provide incentives or environment for improvement. On the contrary, under certain conditions, it tends to promote misallocated resources as exemplified by payments for crop failure on submarginal land. In addition, the program fails to provide sufficient security to prevent the misallocation of resources caused by risk aversion on the part of farmers and by capital rationing on the part of lenders. The amount of stability provided is also not sufficient to meet what is considered to be minimum stability requirements. Under relatively few circumstances does the program provide sufficient income so that it, together with farm income, amounts to three-quarters of average living expenses and one-half of cash farm expenses. Other limitations in the Act include the double tax on ineligible grain producers, the exemption of flax from the levy and the lack of uniformity in the allowance of benefits in the 8 - 12 bushel category when the price of wheat drops below 80 cents per bushel.

There are some of the limitations of the program as tested against what is considered a practical and workable "model" program of crop insurance. In no way does this appraisal represent a test

as to whether the current program is worth having or not. The program was not established to provide insurance. It was established to provide assistance. The fact that it obviated the necessity for relief and provided some security, not only to the farmers but to all of the other people and institutions that that implies in a predominantly agricultural region is justification for its existence. In addition, it did these things not entirely out of public funds. Significant contributions were made by the farmers themselves. By determining awards on the basis of area yields it avoided making payments to some of the inefficient producers. By collecting levies as a percentage of grain sales it collected more when yields and prices were high and less when they were low. And it accomplished this with an annual administrative cost of less than two dollars per farm.

However, in spite of these merits, it is considered that the program could accomplish more with a relatively smaller cost to the public and at the same time would receive general farmer and public support if certain changes and features were incorporated.

One of these changes would be to work towards a more realistic actuarial structure. The levy of one per cent in many cases is entirely inadequate. It might be tentatively established at a maximum of ten per cent for those townships receiving the largest benefits and decrease gradually to one per cent for those townships which have received no or little benefit. The rates might be adjusted by one-



half or one per cent a year depending on whether or not benefits have been received. The maximum payment to farmers in the zero to four bushel category should be increased to \$750. This is still a minimum figure and is probably too low to provide the desired degree of stability and could later be adjusted upward as levy-benefit ratios become more nearly on an actuarial basis. Payments to farmers on submarginal land should be made conditional upon following certain practices. Formulation of plans and co-ordination of activities of governments to assist these farmers in moving to new or irrigation areas or to other occupations would constitute a desirable supplementary policy. Less important changes would include placing the levy on flax, making all producers eligible for benefits, or exempt from the levy those who are ineligible for participation, and making the price policy feature of the Act uniform for all categories. The incorporation of these changes, together with periodic and realistic reappraisals and corresponding adjustments, would do much to put the program on a sound and continuing basis and at the same time provide a framework for a more stable and efficient agriculture.

APPENDIX I <sup>1/</sup>**An Act to Assist Agriculture in the Prairie Provinces****Short Title**

1. This Act may be cited as the Prairie Farm Assistance Act, 1939, c. 50, s. 1.

**Interpretation**

2. (1) In this Act,
- (a) "average price" means the average of the daily closing prices of No. 1 Manitoba Northern wheat in store at Fort William, between the 31st day of July and the 1st day of November in any year as ascertained by the Minister pursuant to the regulations;
  - (b) "Board" means the Board of Review established under this Act;
  - (c) "crop year" means the period of twelve months commencing on the 1st day of August in any year and ending on the 31st day of July in the next following year;
  - (d) "cultivated land" means land that in the year of award was seeded to crop or in summer fallow and includes land seeded to grass in any year if the production thereof was maintained in the year of award;
  - (e) "farmer" means a person who as owner or tenant operates a farm in the spring wheat area or who as a member of a co-operative

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<sup>1/</sup> This is a copy of Chapter 213, Revised Statutes of Canada, 1952.

farm association is engaged in farming in the spring wheat area;

- (f) "grain" means wheat, oats, barley and rye;
- (g) "local improvement district" means in the Province of Saskatchewan a local improvement district organized under the Local Improvement Districts Act of Saskatchewan, and in the Province of Alberta a district as defined by the Improvements Districts Act of Alberta, and in the Province of British Columbia, an assessment and collection district created under the provisions of the Taxation Act of British Columbia;
- (h) "Minister" means the Minister of Agriculture;
- (i) "regulation" means a regulation made pursuant to the provisions of this Act;
- (j) "rural municipality" means in the Province of Manitoba a municipal district to which the provisions of the Municipal Act of Manitoba apply, and in the Province of Saskatchewan a municipality to which the provisions of the Rural Municipalities Act of Saskatchewan apply, and in the Province of Alberta a municipal district to which the provisions of the Municipal District Act of Alberta apply, and in the Province of British Columbia a district municipality as defined by the Municipal Act of British Columbia;
- (k) "spring wheat area" means the Provinces of Manitoba, Saskatchewan, Alberta and the Peace River District of British Columbia; and



(1) "township" means, in the Provinces of Manitoba, Saskatchewan and Alberta, a township according to the system of survey authorized by the Dominion Lands Survey Act, chapter 117 of the Revised Statutes of Canada, 1927, and in the Province of British Columbia a township whose boundaries are confirmed by the Official Surveys Act of British Columbia, and includes any group of settlement or river lots declared by the Governor in Council to be a township for the purposes of the Act.

(2) In this Act unless it is otherwise provided or the context otherwise requires, expressions have the same meaning as in the Canada Grain Act, 1939, c. 50, s. 2; 1940, c. 38, s. 1; 1947, c. 43, s. 1; 1948, c. 24, s. 1.

#### Crop Failure Assistance

3. (1) Subject to this Act, the Minister may in any crop year award to each person who was a farmer from the 1st day of May to the 1st day of November in such year, a sum by way of assistance according to his cultivated land in a township with respect to which an application for assistance has been made by the rural municipality in which that township is situated or, in case there is no such rural municipality, by the government of the province in which that township is situated.

(2) The sum to be awarded by way of assistance under subsection (1) shall be computed as follows:

- (a) if the average yield of wheat in the township is found by the Board to be more than eight and not more than twelve bushels per acre, the award shall be ten cents per acre of cultivated land of the farmer for each cent, or fraction thereof, not exceeding ten, by which the average price is less than eighty cents per bushel;
  - (b) if the average yield of wheat in the township is found by the Board to be more than four and not more than eight bushels per acre, the award shall be one dollar and fifty cents per acre; and
  - (c) if the average yield of wheat in the township is found by the Board to be not more than four bushels per acre, the award shall be two dollars and fifty cents per acre.
- (3) No award under this section shall be made
- (a) with respect to more than one-half of the cultivated land of the farmer;
  - (b) with respect to more than two hundred acres of the cultivated land of the farmer; or
  - (c) with respect to lands not sold or granted, or not agreed to be sold or granted, by His Majesty prior to the 31st day of December, 1940, and for the



purposes of this section such lands shall not be included in computing the cultivated land of a farmer, and the grain grown thereon shall not be included in computing the average yield of a township, but this paragraph does not apply to

- (i) lands disposed of to a settler or veteran under the Soldier Settlement Act, chapter 188 of the Revised Statutes of Canada, 1927, or the Veteran' Land Act.,
- (ii) lands in a Special Area in Alberta constituted by or under the Special Areas Act, 1939 of Alberta,
- (iii) land approved by the Board and held by a co-operative farm association,
- (iv) school lands,
- (v) lands with respect to which an agreement has been entered into between the Government of Canada and the government of a province under the Prairie Farm Rehabilitation Act, or
- (vi) lands lying north of the south boundary of township sixty in each of the Provinces of Alberta and British Columbia.

(4) The number of acres for which an award may be made under paragraph (a), (b), or (c) of subsection (2) shall not exceed a number that bears the same proportion to two hundred as the number of acres of cultivated land of the farmer in the township in respect



of which the award is made bears to the total number of acres of the cultivated lands of the farmer in the townships that are determined by the Board to be eligible for an award.

(5) Where not less than one-half of the cultivated land of a farmer that may be included in the computation of an award under subsection (2) is situated in a township in respect of which an award may be made under paragraph (c) of that subsection and the amount that the Minister may award to him under that subsection is less than two hundred dollars, the Minister may, in lieu of that amount, award him the sum of two hundred dollars. 1947, c. 43, s. 2; 1948, c. 24, s. 2; 1950, c. 47, s. 1; 1951 (2nd Sess.), c. 31, s. 1.

4. (1) A Board of Review shall be established to consist of three persons, to be appointed by the Governor in Council on the recommendation of the Minister, one of whom shall be named chairman.

(2) The Board shall examine all information and data regarding the average yield of wheat in any township for which an application for assistance has been received and shall determine the eligibility of such township for an award under this Act.

(3) The Board shall decide, under the Act and regulations, any question concerning the eligibility of any farmer or class of farmers for an award under this Act.

(4) The decision of the majority of the members of the Board constitutes the decision of the Board.

(5) Any decision or determination of the Board is final.  
1940, c. 38, s. 5.

#### Regulations

5. The Minister may with the approval of the Governor in Council make regulations.

- (a) requiring farmers or elevator operators to furnish, on a prescribed form, all information required under the regulations;
- (b) for determining, for the purposes of the Act, either generally or in specific cases, the area of the cultivated land of a member of a co-operative farm association;
- (c) prescribing the manner in which the average price of wheat shall be ascertained;
- (d) prescribing the manner in which information with respect to the average yields of wheat shall be obtained for the Board;
- (e) providing that in special circumstances another kind of grain may be taken in lieu of wheat as the basis of awards under this Act, and in that event what number of bushels of such other kind of grain shall be deemed to be equivalent to a certain number of bushels of wheat for the purposes of such substitution;

(f) defining who is an owner or tenant for the purposes of this Act, prescribing the minimum areas of farms in respect of which payments may be made under this Act and excluding from the operation of this Act persons who, in such circumstances and under such conditions as are prescribed in such regulations, have occupations in addition to farming or do not reside on farms;

(g) excluding from the operation of any section of this Act any lands in the spring wheat area and any grain grown thereon; and

(h) respecting any other matter deemed necessary or expedient for the efficient administration and enforcement of this Act. 1940, c. 38, s. 7; 1947, c. 43, s. 4.

6. Notwithstanding anything in this Act

(a) Where a block of contiguous sections of land within an eligible township having an area of not less than one-sixth of the township and a side that lies along the boundary of an ineligible township is determined by the Board to have an average yield of more than ten bushels of wheat per acre, such block of sections of land is ineligible for award;

(b) where a block of contiguous sections of land within an ineligible township having an area of not less than one-sixth of the township and a side that lies along the boundary of an eligible township is determined by the Board to have an average yield of eight bushels of wheat or less per acre, such block of sections of land is eligible for award as though it were a complete township; and

(c) where the Board has determined that an area is eligible for award and a rectangular block of sections of land outside such area having an area of not less than one-half a township is determined by the Board to have an average yield of eight bushels of wheat or less per acre, such block of sections of land is eligible for award as though it were a complete township. 1949 (2nd Sess.), c. 34, s. 1; 1950, c. 47, s. 2.

#### General

7.<sup>2/</sup> Every award authorized under this Act shall be paid in two instalments, the first, being sixty per cent of the award, in the month of December and the second, being forty per cent in the

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<sup>2/</sup> Section 6 of Chapter 213 of the Revised Statutes of Canada (of which this is a copy) corresponds to Section 7 of the Prairie Farm Assistance Act, 1950. Therefore, for references in the text to Section 7 (a) and (b) of the Act, see Section 6 (a) and (b) of this Appendix.

month of March next following. 1939, c. 50, s.7.

8. Every award payable under this Act is exempt from the operation of any law relating to bankruptcy or insolvency, or to garnishment or attachment, and is not assignable either at law or in equity.

1939, c. 50, s. 8.

9. The Governor in Council may appoint such officers, clerks and employees as may be deemed necessary for the efficient administration of this Act, and such officers, clerks and employees shall hold office during pleasure, and receive such salary or other remuneration as may be fixed by the Governor in Council. 1939, c. 50, s. 10.

#### Offences - Penalties

10. (1) Every person is guilty of an offence under this Act and liable on summary conviction to a fine not exceeding one hundred dollars , who

(a) violates or fails to comply with any provision of this Act or of any regulation;

(b) in respect to any information or return required by regulation, submits false information or makes a false return thereto; or

(c) falsely claims to be entitled to any payment under this Act.

(2) No award shall be made to any farmer who submits any such false information to the Minister or makes any such false return. 1939, c. 50, s. 11.

### One Per Cent Levy

11. (1) Notwithstanding the provisions of the Canada Grain Act, a levy of one per cent shall be deducted from the purchase price of all grain purchased by or through the managers of licensed country elevators, licensed grain dealers, licensed track buyers or licensed commission merchants and unless previously deducted by such licensees, a levy of one per cent of the purchase price shall be deducted on all grain purchased by the managers of mills and licensed terminal elevators, and transferred to the Board of Grain Commissioners for Canada as hereinafter provided.

(2) Notwithstanding the provisions of the Canada Grain Act, the manager of every mill, licensed country elevator, licensed terminal elevator and every licensed grain dealer, track buyer or commission merchant shall record on the cash ticket or other form of settlement issued to the vendor the deduction of one per cent of the purchase price as hereinbefore provided.

(3) The purchase price for grain purchased on the basis in store at a terminal elevator is subject to deductions of lawful charges for freight, elevation, inspection, weighing and cleaning before calculation of the levy of one per cent hereinbefore provided.

(4) All licensees shall pay the Board of Grain Commissioners for Canada for the credit of the Receiver General monthly, as is provided by regulations, all moneys collected hereunder and any licensee who fails to comply with the regulation is subject to a

penalty or one-thirtieth of one per cent of the amount due for each day that such payment is in default.

(5) Every licensee specified in subsection (1) shall keep or cause to be kept such records and shall make or cause to be made such returns from time to time relating to the collection of the levy hereinbefore provided as may be directed or required by the Board of Grain Commissioners for Canada and all such records and returns shall accurately and faithfully represent the facts of the transactions to which they respectively purport to relate, and are subject at any time to examination by any officer of the Board of Grain Commissioners for Canada; any breach of the provisions of this subsection is punishable on summary conviction by imprisonment for not more than one year or by a fine not exceeding five thousand dollars.

(6) There shall be a special account in the Consolidated Revenue Fund called the Prairie Farm Emergency Fund, hereinafter referred to as the "Fund", to which the Minister of Finance shall from time to time credit all revenue hereunder.

(7) Notwithstanding the provisions of the Financial Administration Act, the Minister of Finance may, subject to the provisions of this Act, on the requisition of the Minister or an officer duly authorized by the Minister, pay out of the Fund awards made under this Act, but no other payments shall, except as hereinafter in this section provided, be made out of the said Fund.





(8) If at any time the Fund is insufficient to pay awards made under this Act the Minister of Finance may, out of unappropriated moneys in the Consolidated Revenue Fund, with the approval of the Governor in Council, make an advance to the Fund of the amount required to meet the deficit.

(9) An advance made by the Minister of Finance under this section is repayable out of the Fund without interest.

(10) For purposes of this section the expression "mill" means

(a) a mill licensed under the Canada Grain Act, and

(b) a mill that is declared by the Parliament of Canada

to be a work for the general advantage of Canada and

at which wheat flour is manufactured, and the ex-

pression "licensee" includes the manager of a mill

mentioned in paragraph (b). 1939, c. 50, s. 6;

1940, c. 38, s. 6; 1948, c. 24, s. 4, 1950, c. 47, s.3.

12. The Minister shall, as soon as possible after the termination of each crop year, prepare an annual report in such form as the Governor in Council may prescribe, which report shall be laid before Parliament. 1939, c. 50, s. 12.

13. All administrative, including travelling and other expenses incurred under this Act, shall be paid out of moneys provided by Parliament for this purpose. 1940, c. 38, s.10.

7th Session, 21st Parliament, 1-2 Elizabeth II, 1952-53

THE HOUSE OF COMMONS OF CANADA

Bill 333

An Act to amend The Prairie Farm Assistance Act, 1939

HER Majesty, by and with the advice and consent of the Senate  
and House of Commons of Canada, enacts as follows:

Part I.

1. (1) Paragraph (c) of subsection (3) of section 3 of The Prairie Farm Assistance Act, 1939, chapter 50 of the statutes of 1939, is amended by adding thereto the following subparagraph:

"(vii) the following lands in the Provinces of Manitoba and Saskatchewan, namely township 25 and lands north thereof in ranges 1 to 17 east of the principal meridian and in ranges 1 to 14 west of the principal meridian, township 29 and lands north thereof in ranges 15 to 29 west of the principal meridian, township 37 and lands north thereof in ranges 30 to 32 west of the principal meridian and in ranges 1 to 9 west of the 2nd meridian, township 49 and lands north thereof in ranges 10 to 19 west of the 2nd meridian, lands north of the Saskatchewan river and North Saskatchewan river in ranges 20 to 28 west of the 2nd meridian, and township 50 and lands north thereof in ranges 1 to 28 west of the 3rd meridian."

(2) Section 3 of the said Act is further amended by adding thereto, immediately after subsection (3) thereof, the following subsection:

"(3a) For the purposes of paragraph (c) of subsection (3), a lease containing an option to purchase shall be deemed to be an agreement for sale."

Part II.

2. (1) Paragraph (c) of subsection (3) of section (3) of the Prairie Farm Assistance Act, chapter 213 of the Revised Statutes of Canada, 1952, is amended by striking out the word "or" at the end of subparagraph (v) thereof, inserting the word "or" at the end of subparagraph (vi) thereof, and adding thereto the following subparagraph:

"(vii) the following lands in the provinces of Manitoba and Saskatchewan, namely, township 25 and lands north thereof in ranges 1 to 17 east of the principal meridian and in ranges 1 to 14 west of the principal meridian, township 29 and lands north thereof in ranges 15 to 29 west of the principal meridian, township 37 and lands north thereof in ranges 30 to 32 west of the principal meridian and in ranges 1 to 9 west of the 2nd meridian, township 49 and lands north thereof in ranges 10 to 19 west of the 2nd meridian, lands north of the Saskatchewan river and North Saskatchewan river in ranges 20 to 28 west of the 2nd meridian, and township 50 and lands north thereof in ranges 1 to 28 west of the 3rd meridian".

(2) Section 3 of the said Act is further amended by adding thereto, immediately after subsection (3) thereof, the following subsection:

"(3a) For the purposes of paragraph (c) of subsection (3), a lease containing an option to purchase shall be deemed to be an agreement for sale."

3. Section 2 shall come into force, and section 1 is repealed on the day the Revised Statutes of Canada, 1952, come into force.

Explanatory Notes

1. (1) At the present time Crown lands in Manitoba and Saskatchewan granted or sold after December 31, 1940, are not eligible for award. The purpose of this amendment is to make eligible the lands in the northern parts of these provinces as defined in the Bill.

(2) Under this proposed amendment a lease containing an option to sell is to be regarded as an agreement for sale. The result is that lands disposed of prior to December 31, 1940, under a lease option agreement will be eligible for award even though the option is not taken up until after that date.

2. The purpose of this clause is to make corresponding amendments to the new Revised Statutes of Canada.

## APPENDIX II

### ESTABLISHMENT OF BUDGETS FOR REPRESENTATIVE SASKATCHEWAN FARMS

#### Land Use

Cropland in the prairie area is limited by the quality of the soil, nature of topography, degree of stoniness, and miscellaneous factors. In the park area there are additional limitations of tree cover and poorly drained sloughs. In particular, the heavy tree cover presents limitations to further cropland acreages. The cost of clearing and breaking this land is the main reason why the proportion of cropland acreage to the total is less in the park area than in the prairie area.

In general, the average acreage in crops as indicated by the records of sample farms was used in these budgets. Changes were made in the case of rye and flax acreages. A small acreage in these crops was indicated in the average figures. These small acreages resulted not from a typically small acreage on all farms but rather from a larger acreage in these crops in small areas. According to the 1951 census, less than ten per cent of the farms in Saskatchewan grew rye in 1950. Most of this was in the prairie area. The figures showed that about five per cent of the farms grew some flax. It was considered, therefore, that rye was grown in significant acreages only on one section and one and one-half

section farms in the prairie area. Rye on other farms and flax on all farms were not considered to be typical crops. The small acreage which was shown in rye and flax was shown in the budgets as wheat and summerfallow. Except for one section and one and one-half section farms in the prairie area, they were divided in the ratio of two to one and included as wheat and summerfallow, respectively.

In the prairie area, the unimproved land consisted of uncultivated areas of native prairie with a small proportion of wasteland in the form of alkali sloughs, coolie banks, etc. In the park area the unimproved land was represented more by various types of tree cover and sloughs. In both areas unimproved land was used for grazing purposes.

#### Seed Requirements

The recommended rate of seeding is as follows: <sup>1/</sup>

|        |                |                   |                   |
|--------|----------------|-------------------|-------------------|
| Wheat  | 1              | to 2              | bushels per acre; |
| oats   | $1\frac{1}{2}$ | to 3              | bushels per acre; |
| barley | $1\frac{1}{2}$ | to $2\frac{1}{2}$ | bushels per acre; |
| rye    | 1              | to $1\frac{1}{2}$ | bushels per acre. |

The most common actual rates of seeding are shown by J.W. Clarke<sup>2/</sup> in a typical prairie area. The most common rates were:

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<sup>1/</sup> Guide to Farm Practice in Saskatchewan, 1951, University of Saskatchewan and Canada Department of Agriculture, Saskatoon, 1951, p. 38.

<sup>2/</sup> Clarke, J.W., Farm Practices in Central Saskatchewan, Economics Division, Canada Department of Agriculture in cooperation with Farm Management Department, University of Saskatchewan, Processed by Saskatchewan Department of Agriculture, Regina, 1951, p. 14.

|        |                                                    |
|--------|----------------------------------------------------|
| Wheat  | $1\frac{1}{4}$ to $1\frac{1}{2}$ bushels per acre; |
| oats   | 2 bushels to the acre;                             |
| barley | $1\frac{1}{4}$ to $1\frac{1}{2}$ bushels per acre; |
| rye    | 1 to $1\frac{1}{4}$ bushels per acre.              |

Accordingly, the following rates were used in the budgets:

|               |        |                        |
|---------------|--------|------------------------|
| Prairie area: | Wheat  | 1.25 bushels per acre; |
|               | oats   | 2 bushels per acre;    |
|               | barley | 1.5 bushels per acre;  |

|            |        |                       |
|------------|--------|-----------------------|
| Park area: | wheat  | 1.5 bushels per acre; |
|            | oats   | 2 bushels per acre;   |
|            | barley | 1.5 bushels per acre. |

#### Feed Requirements for Livestock

Although livestock enterprises in Saskatchewan, particularly in the prairie area, depend to a large extent on grazing resources, they do require a considerable amount of feed above that provided by pasture. Forage, grain and supplements are used to a varying extent for winter maintenance, supplemental feeding or more intensive forms of livestock feeding.

Feed requirements are related to a number of variable factors. Small supplementary enterprises designed primarily to meet the needs of the farm home are generally associated with the more intensive scale of feeding than larger enterprises. Larger enterprises rely mainly on pasture as a source of feed with the use of grain and hay confined more particularly to winter maintenance. Most livestock enterprises on Saskatchewan farms are small and a somewhat more intensive rate of feeding is evident. However, since most of the products are to be used on the farm and in the home, rates of feeding

are not as high as in areas where livestock products are sold commercially.

**Estimated Annual Feed Requirements for Livestock as used in Budgets.**

|                                          | Forage<br>tons   | Grain <sup>1</sup><br>lbs. |
|------------------------------------------|------------------|----------------------------|
| Milk cows                                | 2.0 <sup>2</sup> | 1,200 <sup>3</sup>         |
| Beef cows                                | 1.5 <sup>4</sup> | 300 <sup>4</sup>           |
| Yearlings and two-year olds <sup>5</sup> | 1.0 <sup>6</sup> | 2,000 <sup>6</sup>         |
| Calves                                   | 0.5 <sup>2</sup> | 300 <sup>2</sup>           |
| Sows                                     | -                | 1,200 <sup>2</sup>         |
| Hogs                                     | -                | 1,000                      |
| Hens and chickens                        | -                | 37                         |
| Horses                                   | 2.5 <sup>7</sup> | 900 <sup>7</sup>           |

1 For cattle the grain was assumed to be a mixture of half oats and half barley. For hogs the mixture was three-quarters barley and one-quarter oats. Hens and chickens were assumed to receive three-quarters wheat and one-quarter oats. Horses were assumed to receive all oats.

2 Estimates.

3 The Alberta Dairy Farm Business, based on a report on a survey conducted by the Alberta and Canada Departments of Agriculture and the University of Alberta, Edmonton, July 1945, p. 5, states that cows producing 220 lbs. of butterfat consume about 1,500 lbs. of grain. Packman, D.J., Farm Appraisal Handbook, Economics Division, Canada Department of Agriculture, Ottawa, p. 17 lists grain requirements for cows producing 5000-7000 lbs. of milk at 500-1000 lbs. Hoglund, C.R. and K.T. Wright, Reducing Dairy Costs on Michigan Farms, Department of Agricultural Economics, Michigan State College, East Lansing, Special Bulletin 376, May, 1952, indicate grain consumption of average cows (6,600 lbs. of milk) at 1,330 lbs.

4 Vrooman, C.W., C.D. Ghattaway and Andrew Steward, Cattle Ranching in Western Canada, Economics Division in cooperation with Experimental Farms Service, Ottawa, Publication 778, Technical Bulletin 55, February 1946, p. 38.

5 For farms in the prairie area it was assumed that these animals were sold in the fall at approximately 1½ years. For farms in the park area it was assumed that these animals were sold in the spring after feeding at approximately 2 years of age.

6 Guide to Farm Practices in Saskatchewan, op. cit., p. 121.

7 Packman, D.J., op. cit., p. 17.



Farmers use mainly oats and barley for grain feed. Although the feeding of wheat is practical on some farms it is not a general practice. Forage feeding is accomplished predominantly with the use of grain and slough hay. Tame hay and upland hay are limited in importance and are used on relatively few farms. In the prairie area, it is likely that grain feed requirements are related primarily to feeds consumed by cows producing products for home consumption.

In the park area, grain is also given to beef cattle for finishing purposes. The tables shows estimated annual feed requirements for livestock as used in these budgets.

#### Machinery

Many kinds and sizes of machines are found on farms. Basic machines, however, are those for seeding, summerfallowing, harvesting and power. In these budgets, farms were assumed to be equipped with the usual machinery found on farms in the different areas. One-half section farms were assumed to be equipped with a tractor, truck, one-way seeder, cultivator, harrows, together with miscellaneous tools and equipment. Custom harvesting is a common practice on these farms. Larger farms were assumed to be equipped with the additional machines; combine, swather, sprayer, hay loader and gasoline tank.

Repair rates for farm equipment vary for types and sizes of equipment, the extent to which they are used and the age of the machine. Information on repair rates for farm machinery was obtained

from various sources.<sup>3/</sup> Although repair rates range from one to six per cent, most machines have rates which are at the lower end of this range. It was considered that an overall average of two per cent would be the appropriate rate for these budgets.

Depreciation is another charge that must be made against the equipment. It represents the requirements of cost associated with the replacement value of the capital items over the lifetime of their use. Depreciation allowances are influenced by two main factors. They are affected by the differing lifetimes of the machines and, in addition, they seem to be influenced by the income position of the farmers. Lower income farmers try to achieve lower costs through extending the lifetime of the machines. This difference is exemplified by the situation where farmers with higher incomes use predominantly new machines which are often replaced before their useful life is completed. On the other hand, farmers with lower incomes often rely on lower cost second-hand machines or carry machines on the farm for a greater period of time.

Taking the above into consideration, establishment of depreciation rates for the budgets took account of both the longer lifetime of machines on smaller farms due to lower efficiency of use and the fact that smaller farms would be subject to greater need for reducing costs.

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<sup>3/</sup> Askin, T.H., A Study of Farm Organization Relating to the Adequacy of Farm Units in South West Saskatchewan, A Master's Thesis, University of Saskatchewan, Saskatoon, 1947, p. 69, and Ragush, M., The Establishment of Settlers on Economic Farm Units in North Western Saskatchewan with Particular Reference to Low Productivity Land, Economics Division, Canada Department of Agriculture, Ottawa, 1952, p. 39.

From information available,<sup>4/</sup> depreciation rates of 6,  $6\frac{1}{2}$  and 7 per cent were assumed for the small, medium and large farms, respectively, in the prairie area and  $6\frac{1}{2}$  and 7 per cent for the one-half section and one section farms, respectively, in the park area.

### Buildings

Building investments bear only a limited relation to specific requirements of buildings. The house constitutes the greatest individual investment on most farms and this investment depends mainly on the operator's decision as to the size of investment which he thinks he is able to afford. Therefore, there are large differences in investment between individual farms and between areas. The investment in barns and other buildings relate more closely to actual requirements. With respect to barns, however, a large number became obsolete with the introduction of tractor power. They are frequently being used to only a fraction of their capacity. Reasonable investments in relation to current needs would be limited to the size required to stable the cattle, pigs and possibly two horses. It would represent considerably smaller investments than are actually found in many cases.

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<sup>4/</sup> See Patterson, H.L., Farm Machinery Outlook in the Prairie Provinces, Economics Division, Canada Department of Agriculture, January, 1945; Askin, T.H., op. cit., p. 70; Ragush, M., op. cit., p. 31; and Neilson, J.D. and M.E. Andal, Farm Machinery Requirements in Saskatchewan, 1945, Economics Division, Canada Department of Agriculture, 1945.

For farms in the prairie area, the building values used by Askin<sup>5/</sup> were used as a guide in establishing values assumed in these budgets. For farms in the park area, building values obtained by Ragush<sup>6/</sup> were used.

With regard to building repair rates, Askin used rates of about 1.85 per cent for farms in the prairie area and Ragush used building repair rates ranging from 0.5 to 1.75 per cent for farms in the park area. On the basis of this information, building rates in this study were assumed to be 1.5 per cent.

Depreciation rates for buildings were based on estimates of the probable life of various types of buildings on farms. There is little in the way of detailed specific information on life expectancy of farm buildings but the general information obtained from farm business surveys provides a guide to the selection of depreciation rates.<sup>7/</sup> This information indicates that farm houses have a normal life expectancy of about forty years which is equivalent to a depreciation rate of  $2\frac{1}{2}$  per cent. Barns have a lifetime of from 30 to 35 years with a depreciation

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<sup>5/</sup> Askin, T.H., op. cit., p. 61.

<sup>6/</sup> Ragush, M., op. cit., pp. 30 and 48.

<sup>7/</sup> Stutt, R.A., Some Observations on Farm Houses in Representative Areas of Saskatchewan, Economic Annalist, Economics Division, Canada Department of Agriculture, Ottawa, November 1943, p. 69; Askin, T.H., op. cit., p. 73; and Ragush, M. op. cit., pp. 30 and 48.

rate of about three per cent. For other buildings, lifetimes vary to a considerable extent but perhaps within the range of 15 to 30 years with an average depreciation rate of about four per cent. The above represents a composite rate of about three per cent and this rate was applied in the budgets.

### Livestock

The numbers and kinds of livestock on various sized farms in the different areas was shown on the Cultivated Acreage Reports of the Prairie Farm Administration. The average number of livestock for the period 1945-49 inclusive was used in these budgets. Returns from livestock enterprises are affected by a large number of conditions. Returns are subject to uncontrollable factors such as price and weather conditions and controllable factors resting in the organization and management of the particular enterprise. Such variations are associated with differences in intensity, efficiency and scale of enterprise.

Intensity of enterprise refers to the rate of application of input factors. Varying intensities would be characterized by the sale of cattle of differing ages, production of beef in contrast with breeding animals, production of grain fed in contrast with grass fed animals or by various types of dairy production. In Saskatchewan, varying intensities arise mainly out of different emphasis on beef cattle and dairy products production as determined by opportunity for markets, home needs, availability of

labor, feeds, and other factors. Because of conditions imposed by the market, little emphasis is placed on dairy production. This limits production largely to beef animals. In the prairie area there is the further limitation of feed, and beef animals are often finished on grass. In the park area there is more feed, and animals are often carried through the winter with grain feeding and are sold in the spring as grain fed animals. In both areas, dairy products are produced mainly for home consumption. Sales of cream and eggs generally occur only for a short time in the summer when production is above home requirements. Accordingly, the production rate of these products per animal and per bird is lower than in areas where production is geared to commercial sale. The average annual milk production per cow is estimated at about 4,600 lbs.<sup>8/</sup> This represents an annual butterfat production per cow of from 140 to 160 pounds depending on the butterfat content. Sales of butterfat assumed in the budgets represent the small surplus of butterfat that would occur in the summer months.

Similarly, egg sales are those surpluses that occur in the summer months. Since farm flocks are generally not for commercial production, not much attention is given to them by the farmer with the result that annual production per bird is not very high. According to Ragush,<sup>9/</sup> annual production per bird was nine dozen for forty per cent of the flock as layers.

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<sup>8/</sup> Annual Reports, Saskatchewan Department of Agriculture, Regina.

<sup>9/</sup> Ragush, M., op. cit., p. 36.

### Farm Cash Expenses

The more important items of farm cash expenses on mechanized farms in Saskatchewan include fuel, oil and grease requirements for equipment, upkeep costs on real estate such as taxes and insurance, building and real estate repairs, repairs to equipment, hired labor, in some cases hiring of custom operations, and less important miscellaneous expenses such as hardware, seed cleaning and treatment, veterinary and medicine, breeding fees, etc.

Tractor Costs. The number of tractor hours was obtained by calculating the number of hours worked on each of the normal field operations. Consideration was given to size of tractor, size of machine, speed of operation, and efficiency of use. Tractor hours per cultivated acre were higher in the park belt than in the prairie region. This was due to the differing climates in the two areas and the cultural practices resulting therefrom. Although the actual rainfall is about the same in the prairie area as in the park area, cooler summer temperatures in the park area provide a lower evaporation ratio and leave more moisture for plant growth. Consequently, weeds are much more prevalent in the park area than in the prairie area. Adequate control of these weeds involves more tillage operations. The purpose of summerfallow is to control weeds and conserve moisture and in years of drought, weeds present little or no problem and there is little moisture to conserve. Therefore, in years of crop failure, the number of tractor hours was reduced in line with

what would be usual hours of operation in such years.

The number of tractor hours in an average year for the different sizes of farms in each of the two areas was determined to be the following:

|               |                         |              |
|---------------|-------------------------|--------------|
| Prairie area: | $\frac{1}{2}$ section   | - 303 hours; |
|               | 1 section               | - 539 hours; |
|               | $1\frac{1}{2}$ sections | - 715 hours. |
| Park area:    | $\frac{1}{2}$ section   | - 354 hours; |
|               | 1 section               | - 573 hours. |

In years of low yields the following hours of tractor use were used:

Six bushel wheat yield

|               |                         |              |
|---------------|-------------------------|--------------|
| Prairie area: | $\frac{1}{2}$ section   | - 250 hours; |
|               | 1 section               | - 474 hours; |
|               | $1\frac{1}{2}$ sections | - 621 hours. |
| Park area:    | $\frac{1}{2}$ section   | - 299 hours; |
|               | 1 section               | - 518 hours; |

Two bushel wheat yield

|               |                         |              |
|---------------|-------------------------|--------------|
| Prairie area: | $\frac{1}{2}$ section   | - 250 hours; |
|               | 1 section               | - 449 hours; |
|               | $1\frac{1}{2}$ sections | - 585 hours. |
| Park area:    | $\frac{1}{2}$ section   | - 282 hours; |
|               | 1 section               | - 449 hours. |

Gasoline requirements shown by Kalbfleisch <sup>10/</sup> and oil and grease requirements shown by Ragush <sup>11/</sup> were used.

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<sup>10/</sup> Kalbfleisch, William, Cost of Operating Farm Machinery, Experimental Farms Service, Canada Department of Agriculture, Ottawa, 1950, Publication 750, p. 19.

<sup>11/</sup> Ragush, M., op. cit., p. 32.



Truck Costs. Truck mileages assumed for the purpose of these budgets were based on requirements for the various sizes of farms. Truck costs were based on those shown by Scott<sup>12/</sup>. Fuel, oil and grease costs per one hundred miles for various sizes of trucks for 1950 were as follows:

|                                        |           |
|----------------------------------------|-----------|
| $\frac{1}{2}$ - and $\frac{3}{4}$ -ton | - \$2.77; |
| 1-ton                                  | - 3.25;   |
| $1\frac{1}{2}$ - and 2-ton             | - 4.04.   |

In years of crop failure truck costs were reduced in accordance with the reduced usage which would occur. With an average yield of six bushels per acre, truck costs were assumed to be three-quarters of those in an average crop year and with an average yield of two bushels per acre they were assumed to be one-half of costs in an average year.

Combining and Swathing Costs. Custom rates for combining and swathing as shown by Scott<sup>13/</sup> were used for farms which did not own a combine or a swather. In 1950 these were \$2.00 per acre for combining and \$1.00 per acre for swathing. For years in which yields were six and two bushels per acre, it was assumed that gasoline, oil and grease costs for combines would be reduced by twenty per cent.

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<sup>12/</sup> Scott, H.K., Farm Power and Machinery Costs in Alberta, Economics Division, Canada Department of Agriculture, Ottawa, 1952, p. 13.

<sup>13/</sup> Scott, H.K., ibid., p. 15.

4. The fourth part of the document discusses the implications of the study for practice and policy. It suggests that the findings can be used to inform decision-making and to develop strategies to address the identified issues.

5. The fifth part of the document concludes the study and provides a summary of the key findings. It also acknowledges the limitations of the study and suggests areas for future research.

Taxes. Taxation rates were obtained for 1947, <sup>14/</sup>the mid-year of the period in which information was used. Rates were obtained for those municipalities from which the sample farms were selected. The average tax rate which includes both general and school tax was 30.3 mills in the park area and 24.1 in the prairie area.

Seed Cleaning and Treatment. An allowance of seven cents per bushel was provided for seed cleaning and seed treatment.

Weed Sprays. Allowances made for spraying one-half of the crop acreage at the recommended rate <sup>15/</sup>of five ounces of ester per acre. For those farms not having a sprayer, a 1952 price allowance of one dollar per acre was provided. In years of a two bushel wheat yield, no allowance was made for weed sprays since there would not be sufficient crop or weed growth to warrant it.

Fire Insurance. The standard rate of 30 cents per \$100 of value for the house and barn was used.

Hired Labor. Cereal crop farming has been extensively mechanized through the use of tractors, trucks, grain loaders, seeder-tillers, and combine harvesters. This mechanization has

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<sup>14/</sup> Annual Report, 1947, Saskatchewan Department of Municipal Affairs, Regina, 1947.

<sup>15/</sup> Guide to Saskatchewan Agriculture, op. cit., p. 80.

reduced farm labor requirements to comparatively small amounts. Hired labor is generally required only in peak labor seasons of seeding and harvesting. Farm business studies <sup>16/</sup>have provided information on labor requirements on Saskatchewan farms. On the basis of these studies the following were assumed to be hired labor requirements:

|               |                         |       |         |
|---------------|-------------------------|-------|---------|
| Prairie area: | $\frac{1}{2}$ section   | - 1   | month;  |
|               | 1 section               | - 1.5 | months; |
|               | $1\frac{1}{2}$ sections | - 2   | months. |
| Park area:    | $\frac{1}{2}$ section   | - 1   | month;  |
|               | 1 section               | - 2   | months. |

In years in which wheat yields per acre fell to six or two bushels, hired labor requirements would be considerably less than that indicated above. Both summerfallow and harvesting operations would be on a reduced scale in years of near crop failure. In view of the reduced demand for labor under conditions of low yields, the following were considered to be the hired labor requirements in these years.

|               |                         |               |
|---------------|-------------------------|---------------|
| Prairie area: | $\frac{1}{2}$ section   | - none;       |
|               | 1 section               | - .75 months; |
|               | $1\frac{1}{2}$ sections | - 1 month;    |
| Park area:    | $\frac{1}{2}$ section   | - none;       |
|               | 1 section               | - 1 month.    |

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<sup>16/</sup> See Andal, M.E., Changes in the Farms of West Central and Northern Saskatchewan, 1942-43 to 1947, Economics Division Canada Department of Agriculture, Ottawa 1951; Riecken, T.O. and M.E. Andal, op. cit., p. 39; and Askin, T.H., op. cit., p. 62.

Miscellaneous Expenses. Expenses in this category include such items as small hardware, purchased feeds, breeding fees, veterinary services and medicines, sprays, blacksmithing, etc. For farms in the prairie area, information on these items was provided by Askin <sup>17/</sup> and for the park area information on these items was based on that used by Ragush.<sup>18/</sup> Some upward revision in Ragush's figures was made because of the larger cropland acreage in the farms of the current study than in those described by Ragush. In years in which a six bushel per acre wheat yield was experienced, miscellaneous expenses were reduced by ten per cent and in years experiencing a two bushel wheat yield a twenty per cent reduction was made in miscellaneous expenses.

#### Land Values

The question of land values assumes importance in determining taxes and investment cost. Taxes are always based on the assessed value of the land so that there is no difficulty in determining land values for this purpose. In determining the value for investment cost, the question is more complicated since the market price of land varies from time to time. In Saskatchewan the assessed value is determined by the Saskatchewan Assessment Commission

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<sup>17/</sup> Askin, T.H., op. cit., p. 68.

<sup>18/</sup> Ragush, M., op. cit., pp. 32 and 48.

on a capitalized productivity basis. Long term productivities and prices are used in establishing its value.<sup>19/</sup> This assessed value then might adequately represent what would be a long time market value of the land. It would, therefore, serve as a basis in calculating land investment.

In the prairie area, various studies<sup>20/</sup> indicate the relationship between land class and assessed value. In the Govenlock-Eastend-Maple Creek area in south western Saskatchewan, Land Class III had an average assessment of \$10.74 per acre. Land Class IV had an average value of \$14.92 per acre. In 56 municipal units in south central Saskatchewan assessed values for Land Classes III and IV were \$17.64 and \$18.57, respectively. In central Saskatchewan in the Cory-Asquith-Langham area, assessed values were \$12.92 and \$18.57 for Land Classes III and IV, respectively. The soil on which the budgets in this area are based is Weyburn loam. This would generally fall into Land Class III. For the purpose of these budgets, then, an average value of \$14.00 per acre was used.

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<sup>19/</sup> See Freeman, T.H., W.E. Thompson, and C.H. Chappell, op. cit.,

<sup>20/</sup> See Stutt, R.A., An Economic Classification of Land in the Govenlock-Eastend-Maple Creek Area, Saskatchewan, op. cit., p. 20; Spence, C.C. and E.C. Hope, An Economic Classification of Land in 56 Municipal Divisions, South Central Saskatchewan, op. cit., p. 33; and Stutt, R.A., A Farm Business Study with Particular Reference to the Relation of Farm Types and Land Class, Cory-Asquith-Langham Area, Saskatchewan, op. cit., p. 19.

1. The first part of the document is a list of names and their corresponding page numbers. The names are listed in a single column on the left, and the page numbers are listed in a single column on the right. The names are: "J. B. ...", "J. C. ...", "J. D. ...", "J. E. ...", "J. F. ...", "J. G. ...", "J. H. ...", "J. I. ...", "J. J. ...", "J. K. ...", "J. L. ...", "J. M. ...", "J. N. ...", "J. O. ...", "J. P. ...", "J. Q. ...", "J. R. ...", "J. S. ...", "J. T. ...", "J. U. ...", "J. V. ...", "J. W. ...", "J. X. ...", "J. Y. ...", "J. Z. ...". The page numbers are: "1", "2", "3", "4", "5", "6", "7", "8", "9", "10", "11", "12", "13", "14", "15", "16", "17", "18", "19", "20", "21", "22", "23", "24", "25", "26", "27", "28", "29", "30", "31", "32", "33", "34", "35", "36", "37", "38", "39", "40", "41", "42", "43", "44", "45", "46", "47", "48", "49", "50", "51", "52", "53", "54", "55", "56", "57", "58", "59", "60", "61", "62", "63", "64", "65", "66", "67", "68", "69", "70", "71", "72", "73", "74", "75", "76", "77", "78", "79", "80", "81", "82", "83", "84", "85", "86", "87", "88", "89", "90", "91", "92", "93", "94", "95", "96", "97", "98", "99", "100".

In the park area, the assessed value of land as shown by Ragush<sup>21/</sup> was \$19.00 per acre for improved land and \$3.00 per acre for unimproved land. Accordingly, an overall land value of \$13.00 per acre was used in these budgets.

#### Investment Costs

When the net return of the farm is to be indicated as a residual return to the operator for his labor and management, a further item of cost in the calculation of net income is the cost of capital. This represents an allowance for the use of capital in the form of buildings, land, equipment, and livestock.

The specific allowance to be made for capital cost may be evaluated from alternative viewpoints. One method is to allow a return to capital equal to the alternative cost of borrowed capital. At the present time this would amount to about six per cent. This is to some extent unrealistic because a considerable amount of capital used in the farm business is not obtained by borrowing. It consists of some initial capital used in starting, together with capital accumulated through savings made out of returns from the farm. Therefore, probably a more realistic approach in the selection of a rate for capital cost would be to select a rate which represents

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<sup>21/</sup> Ragush, M., op. cit., p. 58.



a return which could be made from alternative use of capital. The return from government bonds would represent one which is safe and which could be obtained easily. Such a rate at the present time would be from  $3\frac{1}{2}$  to  $4\frac{1}{2}$  per cent.

Since many farms do have a certain amount of borrowed capital, together with larger amounts of accumulated savings, a capital cost allowance of five per cent was used. This rate was allowed on the full value of land and livestock. It was allowed on one-half of the new investment in buildings and machinery. One-half of the investment in buildings and machinery was used as the basis for calculating average investment cost since the new value declines to little or nothing at the end of its life. One-half of the new value in buildings and machinery would approximate the average value in these capital items over the period of their lifetime.

#### Price Adjustment

The information for the budgets discussed above was obtained from studies which have been made over a period of years. The information relating to prices was not all on a comparable basis, because of changing prices. They were, therefore, calculated to a common price level by using official indexes of prices for the various items.

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