

**AN ANALYSIS OF FARMLAND OWNERSHIP VERSUS
RENTAL/LEASING AND MANAGEMENT STRATEGIES OF
PART-OWNERS IN SELECTED AREAS OF SOUTHERN
MANITOBA.**

**A Thesis to be Presented to
The Faculty of Graduate Studies,
University of Manitoba**

**by
TRACY LUSSIER**

**In Partial Fulfillment of Requirements
for the degree of Master of Arts
1992**



National Library
of Canada

Acquisitions and
Bibliographic Services Branch

395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale
du Canada

Direction des acquisitions et
des services bibliographiques

395, rue Wellington
Ottawa (Ontario)
K1A 0N4

Your file *Votre référence*

Our file *Notre référence*

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-315-85967-9

Canada

**AN ANALYSIS OF FARMLAND OWNERSHIP VERSUS RENTAL/LEASING
AND MANAGEMENT STRATEGIES OF PART-OWNERS IN
SELECTED AREAS OF SOUTHERN MANITOBA**

BY

TRACY LUSSIER

A Thesis submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

© 1992

Permission has been granted to the LIBRARY OF THE UNIVERSITY OF MANITOBA to lend or sell copies of this thesis, to the NATIONAL LIBRARY OF CANADA to microfilm this thesis and to lend or sell copies of the film, and UNIVERSITY MICROFILMS to publish an abstract of this thesis.

The author reserves other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without the author's permission.

ABSTRACT

AN ANALYSIS OF FARMLAND RENTAL/LEASING AND MANAGEMENT STRATEGIES OF PART-OWNERS IN SELECTED AREAS OF SOUTHERN MANITOBA.

Economic forces internal and external to the farming sector have influenced the nature and degree of change in Manitoba's agriculture throughout this century. The enlargement of farms to efficiently utilize expensive technological innovations has been accompanied by high land prices which together have pushed the capital requirements of farming operations to high levels.

Rental and or leased land is presently being used in order to arrive at economies of scale in farming operations since credit for capital acquisition in order to purchase land is increasingly difficult to obtain. Rental/leasing has made it possible for established producers to expand without directly purchasing more land. However, renting/leasing is thought to be prevalently associated with undesirable farming practices which have long-term, and often dire consequences.

This study is concerned with the comparison of farm practices which are undertaken on owned versus rented/leased land. Confirmed results included a variety of variations in practices between owned and rented/leased land by part-owners in southern Manitoba. All indications were that intensified positive management practices of part-owners prevailed on owned land versus rented/leased land. Results also indicated positive farm management practices could be obtained by leases or rental contracts which contain specific obligations in the form of provisions.

ACKNOWLEDGEMENTS

I wish to extend grateful appreciation to my advisor, Dr. Sawatzky for supervision throughout the course of this research. His encouragement and support during my graduate work cannot be adequately expressed in a few sentences. Sincere thanks is also extended to Dr. Rounds (Rural Development Institute, University of Brandon) and Dr. Kristjanson (Department of Sociology, University of Manitoba) for their support and analysis.

Also, thanks to Robyn Davey for her undying emotional support and expertise in computer programming. I am greatly indebted.

Last, but not least, thanks to my family who have encouraged, supported and most of all, believed in me. I could not have done it without them.

TABLE OF CONTENTS

ABSTRACT		ii
ACKNOWLEDGEMENT		iii
		Page #
CHAPTER 1	PROBLEM STATEMENT AND RESEARCH OBJECTIVES	1
1.1	Introduction	1
1.2	Trends in Manitoba Land Tenure	4
1.3	Significance of Subject Topic	8
1.4	Purpose and Hypothesis of Proposed Thesis	12
1.5	Significance and Limitations of the Study	15
1.6	Thesis Organization	16
CHAPTER 2	THEORY AND LITERATURE REVIEW	17
2.1	Theory of Land Rent	17
2.2	Theory and Literature Review of Leases	22
2.3	Nature and Function of Farm Leases	22
2.3.1	Types of Rental/Lease	23
2.4	Insecurity Tenure	27
2.5	Static and Dynamic Efficiency in Relationship to Flexibility of Land Tenure	30
2.6	The Theory of Renting/Leasing	32
2.6.1	Share Rentals/Leases	32
2.6.2	All Rental/Leasing Systems	34
2.7	A Review of Research in the Testing of Rental/Lease Theory	36
2.7.1	Empirical Research Review	38
2.7.2	Land Tenure Research in Manitoba	39
CHAPTER 3	PROCEDURE AND METHODS	40
3.1	Study Areas	40
3.2	Sampling Process	41
3.3	Survey Execution	42
3.3.1	Pre-test of Questionnaire	42
3.3.2	Data Collection	43
3.4	Data Analysis	44

TABLE OF CONTENTS (CONTINUED)

		Page #
CHAPTER 4	THE FARMLAND RENTAL MARKET	45
4.1	Introduction	45
4.2	Demand Characteristics	45
4.2.1	Farm Size	46
4.2.2	Farm Type	47
4.2.3	Age of Operator	48
4.2.4	Farm Expansion	49
4.2.5	Distance of Rental/Leased Parcel from Home Base	51
4.2.6	Multiple Renting/Leasing	51
4.3	Supply Characteristics	53
4.3.1	Relationship between Landlord and Tenant	53
4.3.2	Occupation and Residence of Landlord	54
4.4	Lease/Rental Contract	56
4.4.1	Length of Contract	56
4.4.2	Length of Contract Preferred	57
4.4.3	Formality of Lease/Rental Contract	57
4.4.4	Method of Payment	58
4.4.5	Lease/Rental Provisions	60
4.5	Rent Rates	61
4.5.1	Distribution of Rent Rates per Acre	61
4.5.2	Association between Rent and Land Values	62
4.5.3	Association between Rent and Crop Use	62
CHAPTER 5	SOIL QUALITY PRACTICES AND PRODUCTIVITY	65
5.1	Introduction	65
5.2	Crop Selection on Owned and Rented/Leased Land and Its Effects on Soil Productivity	66
5.2.1	Impact of Crop Use on Soil Productivity	66
5.3	Agricultural Practices on Owned and Rented/Leased Land	67
5.3.1	Cropping Practices	67
5.4	Soil Samples	69

TABLE OF CONTENTS (CONTINUED)

		PAGE #
5.5	Change in Tenure Status	69
5.5.1	Impact of Change in Tenure Status	69
5.5.2	Impact of Change in Tenure Status on Capital Expenditures	71
5.6	Effect of Characteristics of the Rental/Leasing Market on Farm Practices	73
5.6.1	Demand Characteristics	74
5.6.2	Supply Characteristics	76
5.6.3	Rental/Lease Contract	78
CHAPTER 6	SUMMARY, IMPLICATIONS AND RECOMMENDATIONS	82
6.1	Summary	82
6.2	Implications	92
6.3	Recommendations	93
BIBLIOGRAPHY		95
APPENDIX		
B	Questionnaire Survey	103
C	S.A.S Computer Program	108

LISTS OF TABLES

TABLE		PAGE #
1.1	Percentage of Total Number of Farmers in Specified Tenure Groups from 1921-1986	5
1.2	Total Area Farmed by Tenure Type and Total Area Farmed	6
1.3	Part-Owner Dependency on Rented/Leased Land in Manitoba, 1921-1986	7
1.4	Percentage of Tenure Groups in Categories of Agricultural Products Sold	8
4.0	Distribution of Number of Farm Operators by Farm Type	46
4.1	Acres by Tenure	46
4.2	Distribution of Number of Operators by Size of Rented/Leased Area	47
4.3	Number of Operators and Average Acres: Owned:Rented/Leased by Farm Type	48
4.4	Number of Operators and Average Number of Acres Owned and Rented/Leased by Age Group	49
4.5	Number of Farms Recording a Change or no Change in Farm Size in the Past Five Years, 1984-1989	49
4.6	Number of Operators and Average Number of Acres Purchased and Rented/Leased for Farm Expansion by Age Group Between 1984-1989	50
4.7	Distribution of Rental/Leased Units and Acres Rented/Leased by from Farm Headquarters	51
4.8	Distribution of Number of Operators Indicating the Number of Units Rented/Leased	52
4.9	Distribution of Rental/Leased Units by Acres Per Unit	52

LIST OF TABLES (CONTINUED)

		PAGE #
4.10	Distribution of Rental/Leased Units and Acres Rented/Leased by Relationship to Landlord	53
4.11	Distribution of Rental/Leased Units Under Relationship to Landlord by Formality of Contract and Method of Payment	54
4.12	Distribution of Rental/Leased Units by Occupation of Landlord	54
4.13	Distribution of Rental/Leased Units by Residence of Landlord	55
4.14	Distribution of Rental/Leased Units by Occupation and Residence of Landlord	55
4.15	Distribution of Units by Length of Time a Unit had been Rented/Leased by the Same Tenant	56
4.16	Distribution of Rental/Leased Units by Length of Lease	57
4.17	Distribution of Number of Operators by Preferred Length of Lease/Rental Contract	57
4.18	Distribution of Rental Units and Acres Rented/Leased by Formality of Contract	58
4.19	Distribution of Rental/Lease Units and Acres Rented/Leased by Method of Payment	59
4.20	Distribution of Number of Operators by Preferred Method of Lease	59
4.21	Distribution of Percent of Operators by Their Preference For Specific Provisions in the Rental/Leasing Market	61
4.22	Distribution of Rent/Leased Units by Rent per Acre	62
4.23	Distribution of Estimated Land Values	62
4.24	Average Rent and Farmer Estimated Land Value by Crop Use	63

LIST OF TABLES (CONTINUED)

5.1	Number of Acres Owned and Rented/Leased by Crop	66
5.2	Number of Operators Indicating Farm Practices on Owned and Rented/Leased Land	68
5.3	Number of Occasions Soil Samples were Taken on Owned and Rented/Leased Land between 1988-1989	69
5.4	Analysis of Operators Indicating Intensification of Practices if Rented/Leased Land was Purchased	71
5.5	The Need for Capital Expenditures on Rented/Leased Land	71
5.6	Expected Expenditures on Rented/Leased Land over the Next Five Years	72
5.7	Degree of Association between Demand Characteristics of the Rental/Leasing Market and Farm Practices	76
5.8	Degree of Association between Kinship Characteristics within the Rental/Leasing Land Supply and Farm Practices	78
5.9	Degree of Association between Characteristics of the Rental/Leasing Contract and Management Practices	81

1.1 Problem Statement and Research Objectives

Economic forces internal and external to the farming sector have influenced the nature and degree of change in Manitoba's agriculture throughout this century. Technological advances in farm machinery, a substitution of capital for labour inputs and the increased use of commercial fertilizers and insecticides have all contributed to increasing total agricultural production. At the same time, the enlargement of farms to efficiently utilize expensive technological innovations has been accompanied by elevated land prices which together have pushed the capital requirements of farming operations to high levels. Credit for capital acquisitions has been advanced by both private and public agencies. It is primarily through the use of credit that many farmers are able to command sufficient capital to acquire farm property and sustain operations.

Despite the progress made in expanding sources of credit to farmers, the difficulty in securing an adequate capital base presents an increasing problem in the face of high land prices and the high cost of borrowed capital, especially since the mid-1970s and through the 1980s. Credit has become "tight" as well as costly as lending institutions have revised policies regarding the ratio of borrowing relative to collateral requirements. In the process, many young persons may be denied a chance to farm even though they have the appropriate qualifications; they cannot obtain access to land in competition with others who command greater amounts of capital.

Recognizing the limitations imposed by lack of capital, the demand for farm-expansion land can be viewed, on the one hand, as

reflecting labour-saving technology which permits the expansion of individual farms and, on the other, as an economic necessity stemming from a general failure of farm product prices to keep pace with increases in farm input prices. Accordingly, farm-size expansion may provide farmers with larger returns relative to management burden. As long as it is still possible to achieve economies of scale, many theorists advise farmers to expand their holdings, which in turn will facilitate optimum capital use and enable farmers to operate at the lowest point of their long-run average cost curve (Shultz, 1978). Renting/leasing land is one way that farmers can achieve efficiencies of scale without depleting their available operating capital.

It is at this point in the discussion the term "lease" must be defined. A lease (sometimes called a demise) is a conveyance or grant of the possession of property made by the owner of that property to another for a determined period of time, in exchange for a consideration called rent. The person who grants the lease is called the lessor, and the person to whom it is granted the lessee (Prystupa, 1986). The terms lease and rental are therefore not interchangeable even though similarities exist. The differences between these two terms are often subtle, however a lease generally is more formal and refined. Rental contracts are often shorter in term and verbal, as compared to a lease which is more often written and longer in term. This thesis will use rental/lease for simplicity since the individuals surveyed formed no distinction between these two terms.

While the land required to expand individual farm size may be either bought or rented/leased, it is becoming increasingly apparent that the full ownership objective is increasingly difficult to attain and the role of renting/leasing as a means to asset access is strengthening. In effect, land rental and/or leasing has made it possible for established producers to expand without directly purchasing more land. For some, especially young people, renting/leasing presents the prospect for an individual to obtain access to major capital. For a farmer desiring to scale down as he approaches retirement, renting/leasing to others allows him to retain ownership of land as a means of sustaining income and hedging against inflation. Moreover, renting/leasing makes it possible for the renter/lessee to apply available funds to inputs other than land, such as machinery. Depending on the nature of the contract, however, renting/leasing may front-load the cost of production and stimulate aggressive, exploitative production methods, much as interest on debt does.

Inasmuch as renting/leasing land aids the process of farm consolidation and growth, it may also facilitate the transfer of land. In the case of intra-family tenancies, it can facilitate an orderly transfer of land between generations.

It is at this point in the discussion that it is important to distinguish between ownership and other forms of usufruct rights.

Each is a type of land tenure, defined as:

“a concept that involves the many relationships established among men that determine their varying rights to control, occupy and use land

property. Land tenure concerns all the ways in which people, corporate bodies and government share in the bundle of property rights" (Barlowe,1958, p.373).

Property rights assure resource use and control in varying degrees, so that:

"ownership tenure includes rights of access to the distribution of returns from resource utilization without time limit. It comprises also the rights to dispose of access rights and distribution privileges and to impose regulations upon those in whose favour such rights are disposed of. In the case of usership alone (tenancy), tenure is confined to the bundle of rights that are surrendered by the owner for a limited period. Furthermore, the user is restricted in rights of disposal. He is greatly affected, not only by the owner's actual use of disposal rights, but by the mere possibility that the owner may use them" (Ciriacy-Wantrup,1968, p.151).

1.2 TRENDS IN MANITOBA LAND TENURE

Near the turn of the present century, tenancy was considered to be a rung in the traditional "Agricultural Ladder" concept, popularized by Spillman. The rungs of the ladder represented the process towards full land-ownership. One climbed the rungs by advancing through a series of steps. These steps included: from unpaid family laborer, to hired hand, to lessor, to mortgaged owner and, finally, to unencumbered owner (Spillman,1919). Each successive step represented a higher tenure status, attained with the passing of time. Since World War II, the goal of full ownership has become increasingly difficult to attain due to significant increased capital requirements. The "ladder concept" continues to have significance since unencumbered ownership appears to be a primary goal for most farm operators. However, in the face of

capital and credit limitations, farmers have had to accommodate to an increasing proportion of their acreage requirements being met through rental/lease.

Analysis of agricultural census data shows that in Manitoba during the 1921-1986 period, there was a change in the tenure-class composition of farm operators and the size of the individual farm unit (Table 1.1). For Manitoba as a whole, the proportion of census farmers who owned all the land they farmed declined from 81.1 percent in 1921 to 50.4 percent in 1986. During this same period, the proportion of part-owners increased significantly from 6.7 percent in 1921 to 41.4 percent in 1986, while the proportion of tenant-only farmers declined slightly from 11.4 percent in 1921 to 8.2 percent in 1986.

Table 1.1 PERCENTAGE OF TOTAL NUMBER OF FARMERS IN SPECIFIED TENURE GROUPS FROM 1921 TO 1986

Census	Owner	Part-owner Part-tenant	Tenant
1921	81.1	6.7	11.4
1931	69.7	11.8	18.2
1941	70.0	14.4	15.6
1951	71.5	18.8	9.7
1956	69.6	21.6	8.9
1961	65.1	26.8	8.0
1966	66.1	28.0	5.9
1971	61.8	32.0	6.3
1976	57.5	35.8	6.6
1981	54.6	37.7	7.7
1986	50.4	41.4	8.2

Source: Derived From Census Canada: Agriculture, 1921-1986.

The data in table 1.1 shows that there has been a steady decrease in the percentage of farmers who are "full owners" while the percentage of part owners/part tenants have steadily increased.

As the group composition of farm operators by tenure class has changed, so too, has the total number of farms, which declined from 53,252 in 1921 to 27,336 in 1986 or 48.7 percent, while total cultivated acreage increased by over 30 percent, from 14.62 million acres to 19.13 million acres.

Data on the total area farmed by tenure type and total acres farmed are presented in Table 1.2. The proportion of owner-operated farmland in Manitoba decreased from 82.1 percent in 1921 to 63.0 percent in 1986, with the proportion of rented or leased farmland increasing correspondingly by 19.1 percent of the total acreage.

Table 1.2 TOTAL AREA FARMED BY TENURE TYPE AND TOTAL AREA FARMED

Year	Acres Owned	Percentage	Acres Rented	Percentage	Total Area Farmed
1921	12,006,675	82.1	2,609,173	17.9	14,615,844
1931	10,917,126	72.1	4,214,559	27.9	15,131,685
1941	11,608,541	68.7	5,282,271	31.3	16,891,322
1951	13,788,328	77.8	3,942,065	22.2	17,730,393
1956	13,818,460	77.1	4,114,357	22.9	17,931,817
1961	13,716,351	75.5	4,453,600	24.5	18,169,951
1966	14,673,880	77.0	4,410,629	23.0	19,083,817
1971	14,063,306	74.0	4,944,953	26.0	19,008,259
1976	13,590,705	71.4	5,435,550	28.6	19,026,255
1981	12,596,581	67.0	6,222,778	33.0	18,819,359
1986	12,307,564	63.0	7,088,953	37.0	19,126,517

Source: Census Canada: Agriculture, 1921-1986.

Thus farms which were once operated by full-owners and full-tenants have been consolidated into larger enterprises by the addition, principally, of rented/leased land and, secondarily, of

owned land. Part-owners' area-rented/leased compared to area-operated reveals a dependency ratio which signifies the importance of rented/leased land to this particular tenure group. Part-owners' dependency on leased land has increased considerably. Table 1.3 shows that for Manitoba, part-owner dependency on rented/leased acreage was approximately 21.7 percent in 1921, whereas by 1986 this ratio was 60.0 percent.

Table 1.3 PART-OWNER DEPENDENCY ON RENTED/LEASED LAND IN MANITOBA, 1921-1986

Year	Dependency Ratio (1)
1921	21.7
1931	38.6
1941	45.5
1951	28.6
1956	29.8
1961	32.5
1966	30.1
1971	35.1
1976	40.0
1981	49.4
1986	60.0

*(1) Area Rented;Leased/Area Operated

Source: Derived From Census Canada: Agriculture, 1921-1986.

The value of agricultural products sold indicates the relative importance of the three tenure categories. In 1986, for the Province of Manitoba, 91.5 percent of the part-owners had total sales of farm products to a value of between \$10,000 and \$24,999, whereas 68.8

and 71.7 percent of the full-owners and full-tenants, respectively, were represented in this category. The same pattern occurs in the \$25,000 to \$49,999 category. In 1986, 79.5 percent of the part-owners sold products with a value between \$25,000 and \$49,999, whereas 47.9 and 48.2 percent of the full-owners and full-tenants respectively sold agricultural products to a value between \$25,000 and \$49,999 (Table 1.4).

TABLE 1.4 **PERCENTAGE OF TENURE GROUP IN CATEGORIES OF AGRICULTURAL PRODUCTS SOLD IN 1986**

Value of Agricultural Products Sold	Owner	Tenant	Part-Owner Part-Tenant
50,000-99,999	30.4	27.4	61.7
25,000-49,999	47.9	48.2	79.5
10,000-24,999	68.8	71.7	91.5
5,000-9,999	80.3	82.0	96.0

1.3 The Significance of the Subject Topic

An important consideration for this study is whether or not the growth of renting/leasing will bring undesirable consequences with it. As such, the inquiry is largely motivated by a concern that the nature of the tenure may affect land use adversely. Particularly, it is the aspect of renting/leasing which gives the farmer incentive to operate such land differently from that which he owns. A hypothesis of many agriculturists is that renting/leasing is prevalently associated with undesirable farming practices which have long-term, and often dire, consequences. There is some consensus that tenants tend to exploit soil resources, so that crop

yields on rented/leased land eventually decline, since the land resource may become irreversibly degraded.

A practice on rented/leased land that is often considered undesirable is continuous row-cropping. Although this practice also occurs on owned land, it does so to a lesser degree than is likely to be the case on rented/leased land. Intensive row-crop monoculture and the production of crops such as grain corn, soybeans, potatoes and sugar beets have been associated with deteriorating soil structure and declining productivity. Various spokesmen have made statements as to the undesirability of monoculture and the intensive production of soil depleting crops (Heady-1956, Smith-1819, Timmons-1953). Concern has been expressed that these practices have been concentrated on rented/leased land. Attempts have also been made to draw a direct link between these practices and the decline in soil productivity that can be expected on rented/leased farmland. So far the connection is not well documented. That there is substance to it is clear, however.

The question of agricultural productivity is important because good agricultural land is a diminishing resource. A federal government discussion paper entitled "Challenge for Growth: An Agri-Food Strategy for Canada", enumerates various constraints on agricultural productivity, grouping them as factors associated with environmental damage and the decline in the natural resource base, namely: soil erosion; environmental pollution; soil compaction; improper soil and water management; a loss of organic matter; and the loss of good agricultural land to urban uses (Agriculture Canada, 1981).

Some farmers are familiar with techniques to limit environmental pollution, to control the deterioration of soil structures and associated soil loss, and to suppress soil erosion from other causes such as inappropriate tillage practices. The failure to take action to forestall these outcomes on rented/leased land may not be a result of lack of education on the farmer's part. Non-application of soil-conserving techniques may also be an attribute of the circumstances and conditions of the contract under which a tenant farmer operates. Ciriacy-Wantrup cites two conditions of instability of property rights which lead to undesirable outcomes:

- 1) "A tenant who doubts whether his lease will be renewed will find it profitable to mine his soil, although soil conservation practices may be quite economical under more stable tenure.
- 2) In periods of political change when stringent government regulations, confiscatory taxes, or outright socialization threatens a sudden and radical redistribution of property rights, all resources users will hesitate to make investments with deferred yield" (Ciriacy-Wantrup, 1968, p.145).

In both cases resource users are likely to adopt a utilization plan which they themselves would regard as wasteful depletion if their property rights were more stable.

A tenant's relative insecurity of tenure is recognized as a potential obstacle to efforts to conserve and improve the land he operates. "Uncertainty allowance" on account of short-term rental/lease contract is offered as an explanation of why tenants

tend to mine the soil and fail to invoke practices designed to preserve and restore soil fertility. Timmons offers three important reasons why a tenant will hesitate to make resource-sustaining investment on rented/leased land. First, he is uncertain that he will retain the usufruct long enough to get full benefit from the improvements. Second, he has no assurance he would be compensated for the residual value of the improvements in case his tenure is terminated. Third, because improvements make the landlord's property more valuable and attractive to other tenants, an increase in rent may be the consequence (Timmons,1953).

The fruits of investments in soil-building practices may not appear for a long period of time. Proper stewardship of the land resource is deterred if rental/lease contracts do not create the proper climate for long-range strategies. If improvements on the rented/leased property are not credited to him, a tenant will be discouraged from developing the appropriate strategy, since he may not realize the full benefit of his investment in labour and/or capital within the period covered by the contract. By contrast, it may be argued that owner-operators typically enjoy a much more secure tenure and may be more readily inclined, given appropriate economic conditions, to adopt and pursue conservation measures because they expect to realize the full benefit of their investments.

A second consideration inherent in this thesis is that problems intrinsically related to renting/leasing may be ameliorated by the form and content of the contract agreement. The contents of a rental/lease contract usually spell out various terms of obligations and prohibitions applying to one or both parties. However, a potential

problem is one of formulating the type of arrangement that will address both security of tenure and change in methods of agricultural production. The terms of a contract must be fair to both parties and provide an incentive for the adoption of an operational strategy that will not exhaust but preserve and sustain the soil resource.

1.4 Purpose and Hypotheses of Thesis

This study focuses on two municipalities of southern Manitoba, namely Rhineland and Montcalm, and involves only part-owners as respondents. The part-owner model may be presumed to be appropriate since it presumably reflects a standardized management strategy.

Farms chosen in close geographic proximity are expected to have less variance in land use practices since they will be sharing similar physical and biological features. This is the situation in the region studied. As long as these conditions are nearly alike, possible differences in land use practices can more reasonably be attributed to tenure.

The region is dominated primarily by the Chernozemic order of soils and more specifically, the Black Chernozem great group of soils. The terrain texture is medium and the topography is that of level to undulating. These soil quality physical factors leads to the conclusion that this region is what may be considered quality land with respect to agricultural land available in Manitoba.

The climate is also characterized by relatively small variations simply due to the close proximity of the two municipalities under consideration. The annual precipitation, which

is based on the total rainfall plus the water equivalent of the total snowfall of a given year, is approximately 45.7 to 50.8 centimeters on average (Environment Canada). The frost free period, stated as the number of days between the date of occurrence of the last spring frost and the first fall frost for a given period of years is in the neighborhood of 115 to 120 days.

Growing degree-day heat units are another form of denoting similarities of these two municipalities. Growing degree-day heat units are calculated as the difference between the mean daily temperatures and the base temperature for the crop under study. The base temperature for most cereal crops (usually 5.5 degrees Celsius) is the point at which plants begin to grow. Rhineland and Montcalm municipalities accumulate approximately 1700 degree days per growing season.

Having described the intent of this study, four principle research objectives may be identified:

- 1) to define rental/leasehold terms and to review the literature on rental/leasing theory and land tenure research:
- 2) to investigate various characteristics of the rental/leasing market such as rates and terms, types and formality of the arrangement, occupation and residence of landlord, in the selected municipalities;
- 3) to discover whether agricultural practices and realized productivity differ between owned and rented/leased land; and

4) to assess the degree to which factors associated with the contract together with other characteristics of renters/lessees and landlords, affect production strategies on rented/leased land.

This study is based on the assumption that part-owners endeavor to utilize their resources in respect to owned land in such a way that the present value of the real net income stream derived from these resources is maximized. For rented/leased land the same objective is considered to hold, but the outcome may be different due to the nature of tenure arrangements. Researchers have often assumed differences in cultural practices and realized productivity between owned and rented/leased land. This thesis will attempt to qualitatively confirm or deny this assumption.

A set of working hypotheses to guide data analysis in this study is provided. These hypotheses state relationships that one would expect to exist on land that is owner-operated or under a rental/lease agreement, namely that:

- 1) owned land in contrast to rented/leased land, will be characterized by;
 - a) better husbandry of the soil,
 - b) higher crop yields, and
 - c) higher levels of annual expenditures on soil maintenance and improvements.
- 2) Part-owners would modify their cropping practices and level of expenditures if they were operating as owners also of the land they now lease/rent.
- 3) Longer-term rentals/leases(3-5 years) and contracts with appropriate provisions lead to better husbandry of the soil than short-term arrangements(1-2 years) and the absence of provisions protecting the renter/lessee.

1.5 **Significance and Limitations of the Study**

Land rental/leasing is presently an important tenure form and is likely to increase in the future. It is postulated that producers, farm organizations and governments could benefit from the findings of this study. This study appears to be one of a few of its kind, to examine the rental/leasing market and the impact of renting/leasing on agricultural practices and crop productivity in Manitoba.

A potential limitation of this study is the inability to generalize to other areas of Manitoba other than those studied. It is well recognized that the municipalities under examination are unique in their ethnic background, that being predominantly French and Mennonite. However, the strategies and applied logic of the respondents surveyed may be presumed to reflect the actions of a much broader cross-section of individuals involved in similar situations and pursuits. Thus, it is reasonable to assume that the conclusions arrived at will have implications for other areas of Manitoba than those expressly analyzed in this thesis.

1.6 Thesis Organization

Chapter 2 defines land-rental and leasehold terms and reviews the literature on rental/leasing theory, land tenure research in Manitoba and previously applied empirical research techniques.

Chapter 3 describes the methods and procedures employed in this study.

Chapter 4 analyses characteristics of the rental/leasing market.

Chapter 5 centers on the impact of tenureship on annual and capital expenditures and on crop productivity.

Chapter 6 summarizes the results of the study and draws the major conclusions.

CHAPTER 2 THEORY AND LITERATURE REVIEW

2.1 Theory of Land-Rent

The development and evolution of rent theory commenced with the writings of the seventeenth century mercantilists and proceeded to classical, neoclassical, and modern economists.

The mercantilist theory of land-rent developed mainly out of policy forms which advocated the use of monetary and fiscal policies to promote national and foreign trade interests.

Sir William Petty (1623-1687) wrote a Treatise on Tax Contributions (1662) where he advanced his views on land-rent. Petty defined land-rent as a surplus when land was used in a productive manner. The surplus or rent is gained when returns exceed costs:

“suppose two acres of pasture land be enclosed, and put them into a weaned Calf, which I suppose in Twelve Months will become 1C. heavier in eatable Flesh which I suppose fifty days food, and the interest of the value of the Calf, is the value or years rent of the land” (Petty, 1662 p.181).

Petty is also known to describe the concept of differential rent which he attributed to variation in soil fertility and location advantage (Petty, 1662)

John Locke (1632-1704), a follower of Petty, treated land as a capital asset whose productive capabilities could be enhanced by human effort. As such the demand for agricultural produce as well as soil fertility would determine the level of land rent.

The views of Petty and his contemporaries were affected by the Physiocrats of the eighteenth century. The Physiocrats were

French Economists who had been influenced by Newtonian Physics. Newtonian principles are especially prevalent in an essays by Cantillon (1685-1734). Cantillon wrote concerning the nature of the land, which he defined as the "Source or Matter from whence all Wealth is produced" (Cantillon, p.3). A contemporary Physiocrat of Cantillon, Quesnay held a similar opinion in that, "Agriculture is the source of all the wealth of the State and that of all its citizens" (Keiper, 1961 p.10). Quesnay (1694-1774) wrote an essay entitled "Explanation of the Economic Table" where he asserted rental income to constitute a surplus which accrued to land improvements made in the past.

Turgot, in his "reflections on the Formation and Distribution of Riches" (1770) furthered the analysis of land-rent by stating that the demand for land depended on the level of agricultural practices. He adds:

"when, as a result of the low price of agricultural products, or any other cause, the harvests do not suffice to assure the Entrepreneur, in addition to the recovery of their investment, profits at least equal to what they would earn on their money by employing it in any other way, there are no Farmers desirous of leasing land" (Monroe, 1951,p.345).

According to Keiper, Turgot is also credited for being one of the first to discuss the concept of diminishing returns in agriculture (Keiper, 1961).

Based upon the groundwork of the mercantilists, the classical theorists between 1770-1820 gave issues relating to land rent greater attention and prominence. The following paragraphs will

serve to summarize the writings of classical economists and their respective contributions to the development of land-rent theory.

Adam Smith (1723-1790) is well known for his study of land-rent. Although Smith's ideas are not strikingly original, he provided an analytical framework to analyze land-rent. This he accomplished by integrating and synthesizing many of the earlier mercantilist ideas on land-rent in terms of economic progress and price-income distribution. Smith defined land-rent as an unearned surplus which accrued to landlords through their exercise of monopoly power:

"As soon as the land of any country has all become private property, the landlords like all other men, have to reap where they never sowed"(Smith, 1819, p.49).

Smith also discusses differential rent in terms of fertility and location. "The rent of the land not only varies with its fertility whatever be its produce but with its situation whatever be its fertility" (Smith, 1819).

Following Smith, and of particular interest is Ricardo's formulation of a new theory of profit which has since been called the "Ricardian Theory of Rent" (Ricardo, 1911).

Ricardo is said to have made connection between land-rent and diminishing returns. Besides emphasizing soil fertility differences upon rent determination, Ricardo added that capital investment in agricultural production will usually explain why there are diminishing returns (Ricardo).

Ricardo's land-rent theory developed mainly out of an agricultural orientation which may explain his emphasis on soil

fertility differences. In hypothesizing about different grades of land, the amount of land-rent, Ricardo says will depend on the differences in the quality of these two portions of land (Ricardo, 1911). Associated with this, Ricardo considers land-rent as the excess payment over the minimum payment necessary to keep the land in production. With respect to differences in soil fertility, Ricardo also considers rent to arise on land when increases in population, previous land improvements and the demand for land have made it necessary for societies to bring less fertile land into use.

Although Ricardo mentions the advantage of location, unlike Petty, Turgot and Smith, it was von Thunen who established a intricate framework for subsequent theoretical studies to follow (Barlowe, 1958).

Ricardo's theory of land-rent was not without its critics. The doctrine of diminishing returns was attacked by classical writers such as Richard Jones and Thomas Thompson, since it assumed historical diminishing returns. Although these men were not able to articulate a comprehensive theory of land-rent, they nevertheless provided subsequent theorists such as Mill, Senior, Sidgwick, and others with a modified Ricardian theory of rent. Mill, Senior and Sidgwick modified and extended the Ricardian Doctrine in three important respects (Keiper, 1961):

1. Land-rent no longer was attributed solely to soil yield differentials.
2. The clear-cut distinction between land and capital was questioned.

3. Ricardo's theory that "rent does not enter into the cost of production" was qualified.

It was not until the Neo-Classical period, (1870-1935) that we come across a different concept of rent in the writings of Clark, Wicksteed, Pareto, and Marshall. Although land-rent was still considered a surplus in the classical scenario, Marshall extends the rent concept to all forms of income derived from a differential advantage in producing a commodity (Keiper, 1961). Pareto considered land-rents as gains or surpluses over opportunity costs. In a similar vein, Marshall interjects the concept of "Quassi-rent" which he describes as an unnecessary profit in the costs incurred (Keiper, 1961). Quasi-rent is defined as returns in excess of variable costs.

The apparent declining economic importance of land in the twentieth century may have been responsible for the apparent shift of emphasis which Marshall effected. He reduced land-rent, which had been traditionally regarded as both important and unique, to a mere "species" of producers' surplus (Keiper, 1961).

In the modern setting, the classical theory of land-rent has been replaced by "economic rent". Economic rent may be defined as the surplus of income above the minimum supply price it takes to bring a factor into production (Barlowe, 1958). The classical theory of land-rent treated rent as the excess payment over the minimum payment necessary to keep land in production or in Barlowe's words "simply as the economic return that accrues to land in the production process" (Barlowe, 1958).

For the purpose of this study, rent in the modern definition (Barlowe's) is appropriate definition to consider.

2.2 Theory and Literature Review of Leases

Introduction

The efficiency of resource use under alternative tenure practices and lease/rental contracts is frequently questioned in agricultural research (Berry-1964, Adams-1968, Lee-1968, Bardham-1971).

The following does not attempt a formal theoretical analysis of all the existing leasing/rental arrangements. Its objective is to highlight principles of efficiency and the theory of rental/leasing. Part 2.3 defines and outlines the variety and functions of farm tenure contracts. Part 2.4-2.5 examines tenure insecurity, and Part 2.6 reviews previous research techniques and the literature on land tenure research.

2.3 NATURE AND FUNCTION OF FARM LEASES

A farm lessor-lessee arrangement is based on the concept of transfer of control over some fixed or working assets from a landlord (lessor) to a tenant (lessee) over a mutually agreeable period of time in return for previously negotiated and specified rent payments from tenant to landlord (Driver,1969). This transfer of control is accomplished by means of a legally binding lease. Hurlburt has defined and summarized the essential characteristics of the farm lease:

"a lease is a contract between a landlord and a tenant concerning use of resources, for a given time period, and for a specified payment. The lease may be either written or oral. The landlord may share in the cash operating expenses, the ownership of livestock, or provide the use of machinery or equipment; or he may furnish only land, with or without buildings and improvements" (Hurlburt, 1964, p.7).

A lease contract is the product of a bargaining process between tenant and landlord, representing an attempt to arrive at a fair division of farm income and obligations. The lease may perform social functions which are also important. For example, it provides opportunity for landless individuals to begin farming. In some instances, the landlord shares the risks and uncertainties of farming with the tenant. Also, the lease is a means of transferring the use of land from one generation to the next. This may be the case when land is transferred from parents to sons or daughters.

2.3.1 TYPES OF RENTAL/LEASE

Since the empirical part of this study is confined to southern Manitoba, only the two most common forms of rental/lease encountered there will be presented. These include cash rental/lease and share-crop rental/lease. There is another contract form which is a combination of the two, namely crop-share:cash rental/lease. It is uncommon however, and therefore not dealt with in great detail.

The cash rental/lease involves a fixed payment for benefits represented by the landlord's land and any other productive assets involved. The payment for use of land is negotiated by landlord and tenant, and is usually paid on a per-unit-area basis, which remains fixed for the duration of the agreement unless otherwise specified.

The landlord receives a cash payment, subject to which the tenant is entitled to all the production realized from the land. The tenant, in this case, assumes all the risk attached to uncertainty of yield and income.

The fixed cash payment will reduce the renter's/lessee's liquid assets if the tenant is obliged to make payment before a crop is harvested. This may engender two effects:

- 1) the debt/equity ratio would be larger than for the other types of renting/leasing encountered in the study area, and
- 2) the amount of available, renter/lessee-owned operating capital will be reduced by the amount of the advance payment.

Although cash rent promotes some risk aversion and reduction of operating capital, it does not necessarily engender lack of equivalence between the tenant's and the landlord's income objectives as compared to other types of renting/leasing. The tenant is free to make all decisions without need to consult with the landlord over sharing of costs and inputs (Driver,1969). The only desired flexibility is in relation to the fixed cash payment.

The fixity of a cash rental/lease causes enhanced positive returns to accrue to the tenant in periods of good crops and high prices, and negative returns in periods of poor crops and low prices. Negative tenant net returns may have harmful effects since they reduce equity in liquid assets and increase aversion to uncertainty. The tenant may see himself forced into "mining out" the resources available to him in order to maintain positive returns on his investment.

A crop-share rental/lease involves crop-share payments for benefits rendered by a landlord's land. The payments consist of sharing of crop receipts in agreed-upon proportions. The landlord may share some of the variable inputs such as fertilizers, herbicides, insecticides, seed and harvesting costs. The tenant furnishes most of the labour and essential inputs for the cropping process. The exact division of output and input is solely at the discretion of the parties involved. An optimal allocation of resources occurs under the condition when the landlord's share of crop yield is the same as his share in cropping expenses, including the opportunity-cost of owning land. This allocation aspect of crop-share renting/leasing is the subject of considerable debate in the literature on tenancy (Adams-1968, Boxely-1971, Castle-1952, Heady-1956, Shickele-1941, Srinivasan-1971).

The crop-share rental/lease spreads the risk of uncertainty in respect to crop income between tenant and landlord in relation to the ratio at which they share production of the various crops. Since risk is spread, the tenant's risk is lessened by lowering the debt/equity ratio and/or aversion to risk as compared to cash rent. As stated earlier, the debt equity ratio is important since a tenant might wish to use liquid equity for other purposes, such as renting/leasing more land.

Although the crop-share contract may be subject to inherent imperfections, these are reduced by four economic incentives cited by Hurlburt. He notes that incentive conditions are required within the rental/lease to encourage operation at a level that will

maximize income from the combined resources of tenant and landlord (Hurlburt,1964). His four conditions are:

- 1) the share of the factor of variable input must be the same as the share of output of product obtained from it;
- 2) the share of all products must be uniform:
- 3) each resource owner must receive full agreed share of the product earned by each unit of resource he contributes; and
- 4) each resource owner must have opportunity to receive return on investment made in one production period but not forthcoming until a subsequent period.

These conditions must be realized, or one or the other of two alternatives will occur:

"Either, the landlord and tenant maximizing the resources contributed separately by each of them, will not jointly attain the same level of profits as when the same amount of resources are maximized under owner-operatorship, or, the farm will be operated at an optimum level of resource use, but with the presence of income transfers from one resource owner to the other"(Arroyo,1961, p.23).

A third form of arrangement is the crop-share/cash rental/lease. This is a combined version of the two types previously described. The share-tenant is required to pay a specified amount of cash in addition to a share of the crops. The crop-share/cash

arrangement is presently not as popular as the tenure forms already cited. However, equivalence between tenant and landlord income objectives may be achieved more effectively under this type of contract than under the other two simply since the tenant does not need a large outlay of initial funds and the landlord is guaranteed money plus a share in the final crop production.

2.4 Insecurity of Tenure

Activities a tenant farmer pursues depends on the duration and security of his tenure. Rental/leasing theory suggests that a tenant operating on a short-term contract, and who has no desire to remain on the holding at the expiration of the rental/lease contract, has no incentive to undertake improvements to the property.

As Currie states:

"the farmer will have no interest in the terminal state of the property. He will be interested solely in his own revenue" (Currie,1981, p.69).

The tenant concentrates on specific activities which promise nearby future benefits. The tenant may have an incentive to behave in ways which would lead to exhaustion of the soil, since most or all of the long-term benefits would accrue to the landowner. The tenant may have incentive to choose crops with quick returns, such as soil-depleting row crops, even though other uses of the land could provide larger net returns in the long run. Even if the tenant has rented/leased the parcel for several years already and hopes to renew the contract again, land improvements will not be voluntarily undertaken, since he faces the risk that he cannot renew the

rental//lease contract. A tenant who improves the landlord's property at his own expense, also runs a risk that:

"such improvements would increase the open-market rent value of the property....he might not only bear the costs of the improvement but also suffer higher rents in consequence. If the burden of the costs of the improvements were such that he was unable to pay higher rents....he might face eviction"(Currie,1981, p.71).

Much depends on the tenant's perception of the security of his tenure, and on the integrity of the landlord. The tenant may feel he has security, derived from confidence in his own ability and value as a tenant farmer, or from a reliance on his relationship with his landlord, even without legal security of tenure.

Insecurity of tenure can occur under all types of rentals/leases. Two main factors which lead to insecurity are:

- 1) verbal or written arrangements/contracts in which the details are minimal and where non-foreseeable future disagreements become difficult to reconcile; and
- 2) an open or one-year contract which is too short to justify long-term commitments.

A curtailment of investment on rented/leased land is often attributed to lack of provisions which assure the tenant of a return for inputs upon which returns may not be realized within the duration of the contract. An investment with a recovery rate of more than the time covered by the contract is likely not to be undertaken in the absence of a provision for compensation in respect to the

unrecovered portion of the investment. Since investment benefits may accrue over a period of years, while costs must usually be paid immediately, either the tenant must stay on to receive the full benefit or be compensated for the unrealized return when the contract expires. This suggests a need for written and longer-term arrangements that contain provisions to compensate for disturbances and unexhausted tenant inputs.

The advantages of long-term rental/lease contracts have been stressed. However, both owners and tenants may find short terms to their advantage:

"both parties may be reluctant to tie their hands for a long period because of general economic uncertainties and because of uncertainty about frictions between themselves arising from the execution of the lease. Reduction of these two causes of short leases and short occupancy appears as prerequisite for increasing the use of longer lease contracts"(Ciriacy-Wantrup,1968, pp.152-153).

A short-term contract may give the tenant as much security as he needs, but in many instances it merely indicates to the tenant that he will be asked to move whenever the landlord finds a tenant he believes will be more suitable.

Pending further investigation, the literature consulted suggests that insecurity of tenure affects the rate of investment in the production process, as this relates to the land, in a negative way. Theory holds that this leads to inefficiency. This will be discussed in depth in the following section.

2.5 Static and Dynamic Efficiency in Relationship to Flexibility of Land Tenure.

Integral to sound agricultural land tenure is an understanding of basic economics, of the allocation of scarce resources among several alternatives so as to maximize satisfaction for those involved. A measure of how well scarce resources are allocated is described as "economic efficiency". The concept of efficiency was traditionally applied in a static context. Static theory examines the allocation of resources at one point in time. Three different allocation rules must hold for static efficiency (Arroyo,1961, p.19).

These are:

- 1) the marginal rate of substitution between outputs must equal the ratio of their prices;
- 2) the marginal rate of substitution between inputs must equal the ratio of their prices; and
- 3) the marginal rate of transformation of any input into any output must equal the ratio of their prices.

Dynamic efficiency analysis goes one step further. It focuses on the allocation of resources over time. Modifying the rules for dynamic efficiency is the additional condition that the present value of revenues minus costs be maximized.

Various ways of employing labour and capital inputs result in a variety of net benefit streams. Specific inputs are potentially useful in yielding revenues over a long period of time while other inputs yield revenues over a short term. The activities a tenant farmer pursues are affected by the duration of his tenure. Static efficiency is achieved when a rental/leasing arrangement fulfils the conditions

necessary for the maximization of profits in a single time-period such as one year in crop production. In this situation, longer-term advantages of improving soil productivity are ignored at the expense of short-term profits. Dynamic efficiency, in contrast, is achieved when a rental/leasing arrangement is conducive to maximizing the income of both tenant and landlord over a relevant time span.

"It is not the income to the tenant or landlord in a single year which is important but rather the combined income of the two over a period long enough that all aspects of efficient farming can be reflected"(Heady,1955, p.639).

As Lev and Campbell state, tenant farmers' choices must be directed towards both the achievement of short-term goals as well as the maintenance of a range of options available to them in the future. A short-term rental/lease does not provide for flexibility. Flexibility is needed in order for a tenant farmer to strategically manage his resources over an extended period of time. This fact makes investment in soil improvements and other long-term investments economically unattractive when land is operated under a short-term arrangement. Flexibility captures many of the important temporal considerations which influence a tenant farmer's decisions. Flexibility is defined as:

"a measure of the relative capacity of a system to respond to changing or new circumstances" (Lev and Campbell,1986).

Flexibility must be regarded as an important consideration in allowing long-range goals to be achieved, whether they be the maximization of income or the reduction of risks. The concept of

flexibility can not truly be incorporated without the stability of a long-term contract, since otherwise dynamic efficiency may not be achieved.

The following section examines the theory of land-rent and leasing. It does not take into consideration the dynamic aspects of resource allocation over time. Nevertheless, static theory provides the foundation from which to construct the dynamic principles of efficiency.

2.6 The Theory of Renting/Leasing

It is acknowledged that share-rental/share-leasing arrangements were the most common form of tenure prior to the present century. It may be argued that share tenancy is still the most common form of tenure. Thus, when examining the history of tenancy, the main focus of criticism of the various undesirable phenomena with which tenancy is associated, was accorded to share-tenancy.

2.6.1 Share Rentals/Leases

Many early economic writers including the classical economists Smith-1819, McCulloch-1965, Mill-1965, Young, and Marshall-1930 expressed great dissatisfaction with share-tenancy. These writers stated that overall improvement in agricultural production, such as the adoption of new technological inputs, would be slower and possibly not forthcoming under share-rents. Share-tenancy was acknowledged as a hindrance to general farm improvements. Smith (1819) criticized share-rents by stating:

" it could never, however, be the interest of this species of cultivators (share-tenants) to lay out in the future improvement of the land any part of the little stock which they might save from their own share of the produce because the landlord who laid out nothing was to get one-half of what ever it produced"(Smith,1819, p.20).

Smith stated that share-tenancy discouraged land improvements since the landlord benefited from capital input by the tenant without contributing to these improvements. Mill approvingly agreed with Smith on the concerns dealt with in the Metayer System (Mill,1965). The Metayer System refers to a 50% crop-sharing tenure system, as the term "Metayer" means half. In practice crop-sharing is not necessarily restricted to half of the produce, for it may take on a variety of forms arrived at through the arrangements agreed upon by the landlord and tenant. Mill disapproved of share rents on the grounds that neither the tenant's nor landlord's actions would maximize net profit. Mill cites insecurity of tenure as influencing decisions made by the parties involved. McCulloch's conclusions are similar. He states:

"Whenever it (the Metayer System) has been adopted, it has put a stop to all improvement, and has reduced the cultivators to the most abject poverty"(McCulloch,1965, p.471).

Arthur Young is quoted by Mill as having also condemned the Metayer System:

"There is not one word to be said in favour of the practice and a thousand arguments that might be used against it. In this most miserable of all modes of letting land, the defrauded landlord receives a contemptible rent; the farmer is in the lowest

state of poverty; the land is miserably cultivated; and the nation suffers as severely as the parties themselves. Whenever this system prevails, it may be taken for granted that a useless and miserable population is found, a clear proof of imbecility of the Metayer System" (Mill,1965, pp.301-302).

A positive outlook on share-tenancy was presented by Chateauvieux, when he analyzed the situation in late eighteenth-century Italy in the Arno Valley, Piedmont and Tuscany. A healthy economy and flourishing agriculture is described by Chateauvieux, which he contributes to a large body of skilled labour relative to the land and a more equitable system of dividing the produce from the land (Mill,1965). Mill goes as far as to recommend that:

"the Metayer System not be introduced where the exigencies of society have not naturally given birth to it; neither should it be abolished on a mere a priori view of its disadvantage" (Mill,1965, p.310).

Marshall continued the research of share-rent. He administered marginal analysis to point out that under share-cropping, the tenant only applies labour input up to the point where his marginal product of labour is equal to his alternative wage-rent. Consequently, less labour is employed than in the case of an owner-operator (Marshall,1930).

2.6.2 All Rental/Leasing Systems

More recently, Schickele employed Marshall's marginal analysis in evaluating various rental/leasing systems on the basis

of efficiency criteria, i.e., input-output ratio. These criteria stipulate:

- 1) the intensity of labour and capital application per unit land are such that marginal costs equal marginal returns; and
- 2) the proportional combination of factors is such that all factors yield the same return as similar factors in alternative uses. Returns to any of the resource owners and operators are based on the marginal value and productivity of the resources that they contribute (Schickele, 1941).

Schickele states that cash and share-contracts can include arrangements which may force the farm operator to use labour, capital and land resources inefficiently on rented/leased land. As well, local customs may be such that the most efficient tenant is not selected and therefore also cause deviation from the optimum concerning factor inputs. Other researchers have stated that if these tenants pay share rents, they will farm less "efficiently" than either their cash, or part-cash/part-share counterparts.

Heady, in contrast to his predecessors, integrated his theoretical and empirical research efforts with all aspects of land tenure. Criteria were developed that analyzed the efficiency and equity of leasing systems. Heady defines the "perfect lease" as:

"one which allows the same farm plan to be most profitable for the landlord and the tenant; this plan should also be the one which is optimum for the farmer as a whole. Besides, the "perfect" lease

requires that the total income obtained by both the landlord and tenant on a leased farm must be equal to that earned by an owner-operator who maximizes the net value of the farm output from given resources at existing input and output prices"(Heady,1956, p.3).

Heady's "perfect" lease criteria may provide a perspective from which leases can be judged. This "perfect" lease, however, is not easily obtained since there are many variables to account for.

Heady's optimum lease elicits rational responses similar to those of an owner-operated farm, with one qualification. The owner-operated farm must not be stressed by mortgage payments, since these may have effects indistinguishable from tenancy and may elicit more exploitation than that engaged in by tenants with an adequate amount of capital. Toussaint, in connection with the above, recommends that a debt-free owner-operator who receives all the returns, might be thought of as an efficient model for tenancy studies (Toussaint,1955).

2.7 A Review of Research in the Testing of Rental/Lease Theory

In more recent years, research has been undertaken in the United States to empirically determine the nature and extent of misallocation of resources resulting from leasing arrangements.

The debate, in tenure-related literature, has been motivated by the elaboration of the inefficiencies and abuses engendered within the existing land rental/leasing system (Berry-1964, Boxely-1971, Chryst-1955, Dorner-1964, Heady-1956, Issawi-1957, Johnson-

1988, etc). Inefficiencies are stated to be caused by the landlord's and tenant's inability to negotiate a farm plan of optimal efficiency according to economic theory.

Many research projects have been based upon descriptive analysis (Berry-1964, Chryst-1955, Dorner-1964, Heady-1955, Hurlburt-1964, Reiss-1968, Timmons-1957). Few have used production functions (Heady/Kehrberg-1956), and linear programming techniques (Heady-1957).

The technique most applied in land tenure research has been descriptive analysis. Data is collected through personal interviews, mailed questionnaires, agricultural census reports, and farm records. Typical data collected in descriptive studies include information regarding farm organization and agricultural practices. Analysis of the data includes frequency tabulations and statistical tests.

Descriptive studies have been successful in identifying rental/lease-engendered inefficiencies. However, the information obtained conveys a static situation, not dynamics over a period of time.

The production functions employed by Heady/Kehrberg-1956 represents a case in which researchers have attempted to test the efficiency of various rental/leasing systems by means of fitting Cobb-Douglas production functions to collected data. A problem with production functions is their failure to standardize across tenure groups for management and labour differentials. Since the results are obtained by regression analysis, problems such as multicollinearity and autocorrelation may be encountered and the results

may not produce a production function corresponding to the true economic relationships.

Linear programming models, by contrast, deal with production on a specific farm. Heady, Dean and Egbert employed this approach to investigate the relative efficiencies of alternative farm rental/leasing arrangements. The guide they adopted was Heady's optimum farm plan for tenant and landlord (Heady, 1956).

2.7.1 Empirical Research Review

Leasing theory states that certain lease practices result in deviation from optimum resource use. Heady employed a linear programming technique to investigate farm practices of tenants and landlords in Iowa. Two representative organizational units were chosen. Static and dynamic programming methods analyzed several production planning periods. Results of their study indicated that although owner-operator farms maximized their resource inputs in both the single period and multi-period models, the differences among the various farm organizations and types of lease agreements were not great (Heady, 1955). In a separate study of Iowa farmers, Heady and Kehrberg studied the effects of lease types on farm efficiency. They tested the hypothesis that cash-rent farms operated more intensively than share-rent farms. The survey results were, that cash-tenants farmed more aggressively than share-croppers. However, the differences appeared to vary largely with the factors of production.

The type of lease appeared not to be significant, since land was a limiting factor for crop-share lessee and capital for cash-rent (Heady and Kehrberg, 1952). Heady and Kehrberg also studied the

amount of fertilizer used, with and without cost sharing. Here too, the evidence was inconclusive.

In a variety of other separate studies performed in the Midwest, no proof surfaced which showed that share-rent operators farmed less intensively than cash-rent operators and full owners (Chyrst-1955, and Ottoson-1955).

In a study of North Central States, Hurlburt found no significant differences between full owners and crop-share/cash rent operators with respect to the planting of legumes and the implementation of pasture improvements. Expenditures for fertilizer were the same per acre on each. Also, Hurlburt found owner-operators following the same cropping practices as the tenants but that their resource combinations changed as they increased input use (Hurlburt,1964, p.18).

2.7.2 Land Tenure Research in Manitoba

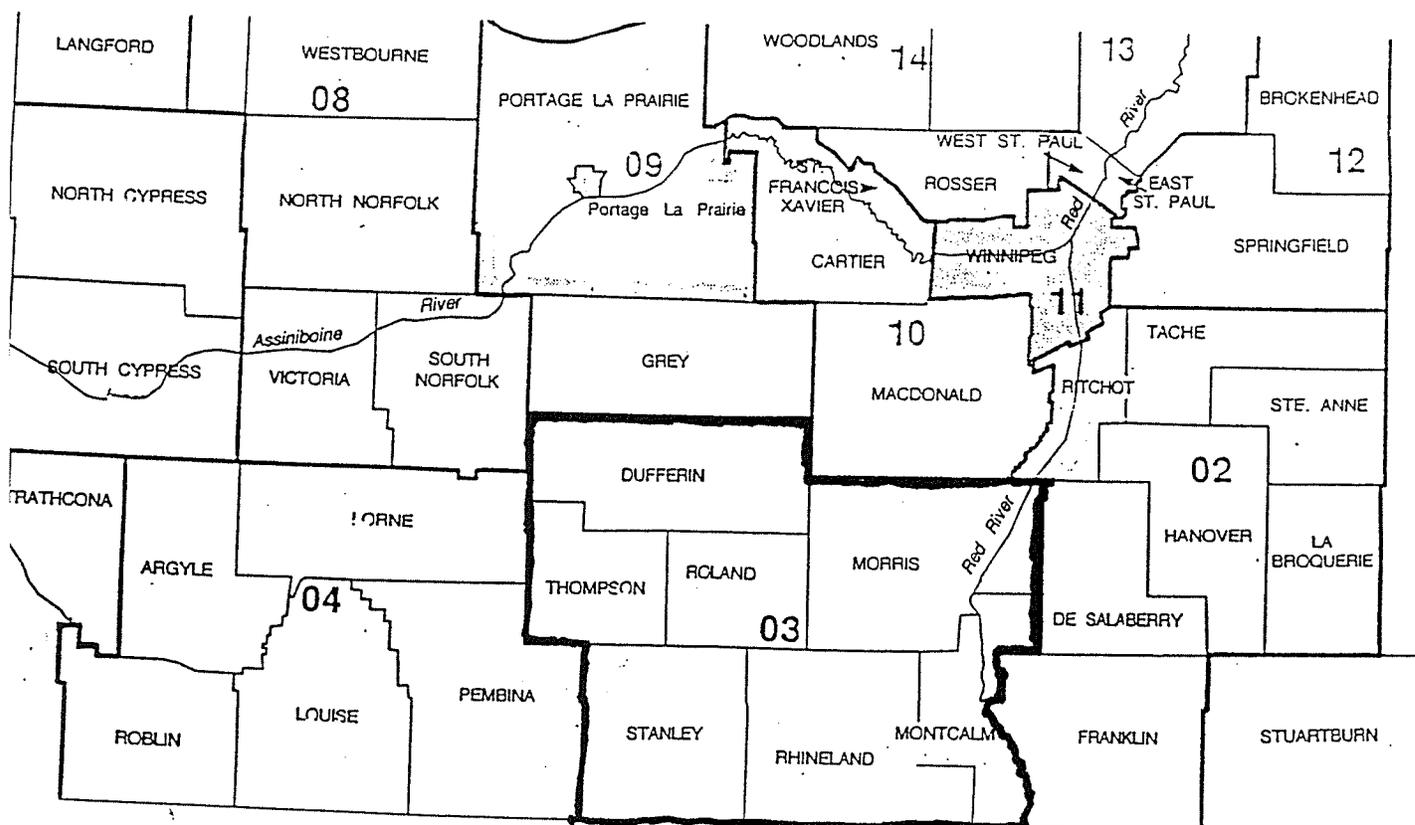
In reviewing the limited literature, it is apparent that few attempts have been made to analyze the rental/leasing situations in Manitoba as it applies to agriculture. Gilson (1960), in his research report Economic Aspects of Tenant-Operated Farms in Southwestern Manitoba is, to date, the only author to run a study which lends itself to the specific objectives of this research. Gilson noted that at that time roughly 30 percent of the farms in Manitoba had some connection with rental/leasing arrangements and that it was on the rise. The objectives of Gilson's study were similar to those of this study. There was one major difference: share-rent arrangements were the only agreements involved in the sample.

Chapter 3 Procedure and Methods

3.1 Study Area

Descriptive analysis is the method adopted in this study. Data collected by a personal interview survey includes information on the land rental/lease market and data on land use practices and crop productivity.

The Rental/Leasing Survey conducted in this area was undertaken in the municipalities of Montcalm and Rhineland, both of which are located in crop division three by Census Canada. Note that not all of the municipalities in crop division three were surveyed. This was not the intent of this study. Map A depicts the location of this region.



The region is characterized by relatively small variations in soil quality and climate. These characteristics are important determinants of general agricultural practices and cropping patterns.

3.2 Sampling Process

It was decided from the outset to sample farmers who are part-owners. It was posited that a survey sample consisting of this group would provide ample opportunity to analyze a flexible and wide range of farm practices with respect to different management schemes.

The 1986 Census of Agriculture provides data on the number of part-owners residing in agricultural regions and the number of farm operators reporting various agricultural endeavors (types of crops grown) on a division basis. One of the Divisions with a large percentage of part-owners included Division 3 (note Division 3 includes the two municipalities under investigation). As well, 68.5 percent of the farms in Division 3 were categorized as cash-crop farms and 43.0 percent of the farmers were categorized as part-owners/part-tenants by the 1986 Census of Canada. It is felt that the combination of part-owner/part-tenant classification coupled with the cash-crop group would provide for an interesting analysis on farm management schemes. However a failure to be a cash-crop farmer did not disqualify a respondent.

3.3 Survey Execution

A requirement of survey design is precision and economy. A literature review of survey techniques has shown that personal interview questionnaires are excellent in the collection of data.

" Although the most costly method in time and dollars, the personal interview is the most effective means to obtain information, both quantitatively and qualitatively. The person-to-person situation creates a setting in which ambiguous answers can be clarified. It lets the interviewer control the question sequence and probe for additional details to any or all of the questions to improve the quality of the data. Further, the personal interview is not as dependent on the educational and literacy level of the respondents as other methods"(Tounsbury and Aldrich,1972, p.91).

In addition to the superior features afforded by personal interview questionnaires, the decision to collect data by such a method was strongly influenced by the relatively small size of the survey region as well as only 100 questionnaires to be administered.

3.3.1 Pre-test of the Questionnaire

A beneficial activity related to constructing a questionnaire is the time spent on pre-testing (Stoddard,1982). As part of this research a pre-test of the questionnaire was conducted. The test was administered to 10 part-owners from the Municipality of Stanley, which is located in the same Division (Division 3) as the two Municipalities under investigation, Rhineland and Montcalm. The

names of the participants were taken from a sample list. The responses were not included in the results given here, however.

The purpose of a pre-test is primarily to judge how well the questions were understood and answered. Most of the questions were properly answered, however the wording of two questions needed slight clarification. No other area of misunderstanding seemed to exist.

On the basis of the pre-test, extensive use and variety of specialty crops were observed. Given these facts, slight modifications due to the addition of more cash-crop groups were made to the original questionnaire draft. A copy of the final questionnaire is reproduced at the end of the thesis.

3.3.2 Data Collection

Precisely 100 personal interview questionnaires were completed by part-owner farm operators in Rhineland and Montcalm, between January 3, 1990 and January 21, 1990. A complete list of names and addresses of part-owners who lived in the municipalities of Montcalm and Rhineland in 1986 was provided by Census Canada upon request. These names were assigned numbers. The numbers were then randomly selected from a Table of Random Numbers. The process of randomly selecting interviewees was continued to the point when 100 of the samples fit the part-owner category. Over sampling was required since some farmers had changed their tenure classification from the time of Census of Canada 1986 to the time of this study in 1990. All 100 of the respondents co-operated in the study.

3.4 Data Analysis

S.A.S (Statistical Analysis System) package was employed to provide various statistical analyses such as frequency distribution, cross-tabulation and regression analysis in order to achieve significant hypothesized relationships.

The first step in analyzing data is examining the distribution of each of the variables under consideration. Means, standard deviations, minimums, maximums, range and sum values were all obtained using these frequencies. Once these values were acquired, an investigation into sets of relationships among two or more of these variables took place by the use of Crosstabulations which produces contingency tables in order to cross-examine frequency data. The test employed in conjunction with contingency tables in this particular case, is the Chi-square (X^2) test.

Chapter 4

The Farmland Rental/leasing Market

4.1 Introduction

The objective of this chapter is to describe certain characteristics of the rental/leasing market involving part-owners in selected municipalities in southern Manitoba. Four distinct components of this market will be examined, namely those associated with demand, supply, the legal contract and price. The demand aspect involves items such as age of the operator, the extent of farm expansion by rental/lease and purchase, the distance of land parcels from the home base and the number of contracts held by one operator. The examination of supply characteristics focuses on occupation, kinship and residence of landlords. The examination of the legal contract describes items such as length of rental/lease, method of payment, formality, and the content of the contract in terms of obligations and prohibitions required from and imposed on both parties. The investigation of price describes the association between rent and relevant variables.

4.2 Demand Characteristics

The majority of sample respondents derived their income mainly from cash-crops as only 12 percent of the farmers were classified under other farm types.

Table 4.0 DISTRIBUTION OF NUMBER OF FARM OPERATORS BY FARM TYPE

<u>Farm Type</u>	<u>Number/Percent</u>
Cash-crop	88
Beef	4
Swine	4
Poultry	2
Dairy	2
Total	100

* Farm Type was established when gross farm income was 51 percent or more for an enterprise.

4.2.1 Farm Size

Part-owners farmed an average of 657 acres. Of this, 301 acres were owned and the remaining 356 were rented/leased (Table 4.1). In total 54 percent of the land was rented/leased.

Table 4.1 ACRES BY TENURE

Tenure	Total Acres	Average Acres	Percent
Owned	30,116	301	46
Rented/leased	35,914	356	54
Total	66,030	657	100

Fifty-one percent of the part-owners rented/leased 300 acres or less, while 49 percent of the operators rented/leased over 300 acres (Table 4.2).

Table 4.2 Distribution Of Number Of Operators By Size Of Rented/Leased Area

<u>Acres Rented/Leased</u>	<u>Number</u>	<u>Percent</u>
1-150	18	18
151-300	33	33
301-450	22	22
451-600	10	10
601-750	6	6
751-900	5	5
Over 900	6	6
Total	100	100

There is a small difference between owned and rented/leased land in the proportion of land actively being cropped. Ninety eight percent of the owned land and close to 100 percent (99.86) of the rented/leased land in this survey was farmed, representing 29,611 and 35,862 acres respectively.

4.2.2 Farm Type

The ratio of rented/leased acreage to total acres farmed is a good measure of the importance of rented/leased land (Table 4.3). The ratio was highest for cash-crop farmers at 57 percent, followed by beef farmers with 25 percent, Dairy (20%), Poultry (17%), and swine (11%).

Table 4.3 Number Of Operators And Average Acres Owned:Rented/Leased by Farm Type (1)

<u>Farm Type</u>	<u>Operators</u>	<u>Owned Land</u>	<u>% Rented/Leased Land</u>	<u>%</u>	<u>Total Acres</u>
Cash-Crop	88	303	43	397	700
Beef	4	240	75	80	320
Swine	4	310	89	40	350
Poultry	2	285	83	60	345
Dairy	2	320	80	80	400

(1) A farm type is identified with a particular enterprise whose contribution to gross income is 51 percent or more.

4.2.3 Age Of Operator

A factor considered relevant to the rate of tenancy is the operator's age. The term "rate of tenancy" is equivalent to the proportion of the land rented/leased in relation to total acres farmed. The rate of tenancy is expected to be inversely related to age. However, the relationship of tenancy with operator's age was not found to be statistically significant (Table 4.4, T-test under 45 years of age versus 45 years and older). Owned land acreage did increase over the lifetime of the individual and rented/leased land decreased.

Table 4.4 Number Of Operators And Average Number Of Acres Owned And Rented/Leased By Age Group

Age	# of Operators	Owned Land	%	Rented/Leased Land	%	Total Acres Farmed
Under 25	2	200	24	618	76	818
25-34	11	265	36	471	64	736
35-44	26	246	45	327	55	546
45-54	33	307	51	290	49	597
55-64	25	388	48	425	52	813
65 @ Over	3	400	91	40	9	440
Average		301		356		657

4.2.4 Farm Expansion

The size of farming operations tends to change over the course of time. In this survey, 61 percent of the part-owners had increased their acreage over the past five years, 13 percent decreased, while 26 percent had not changed their land base (Table 4.5).

TABLE 4.5 NUMBER OF FARMS RECORDING A CHANGE OR NO CHANGE IN FARM SIZE IN THE PAST FIVE YEARS, 1984-1989.

<u>Farm Size</u>	<u>Number/Percent</u>
Increased	61
Decreased	13
Remained the Same	26
Total	100

In terms of acreage, the farms which had expanded in size were slightly larger than the overall average farm size, 689 acres compared to 657 acres. One hundred percent of the expanded acreage was devoted to cropland. None was rented/leased for pasture.

The expansion of farm size was heavily dependent on land rental/leasing. Of the 12,258 acres added in the past five years, 92

percent were rented/leased while only 8 percent were purchased (11,250 versus 1,008). Of the 61 part-owners expanding their operation, 50 had expanded exclusively by renting/leasing land (211 acres on average), 7 part-owners had expanded exclusively by purchasing land (93 acres on average) and 4 part-owners relied on both buying and renting/leasing additional land. These 4 purchased and rented/leased on average 263 acres.

The study found the proportion of younger operators (under 45 years of age) expanding their farm differed to a large extent from older operators (45 years and older)[Table 4.6]. Seventy two percent of the younger operators (28 out of 39) compared to 48 percent of the older operators (29 out of 61) had expanded. *Note: 28 of 39 operators under the age of 45 expanded their farm (Table 4.6). Also, 29 operators of 61, 45 years and older expanded their farm (Table 4.6).

Table 4.6 NUMBER OF OPERATORS AND AVERAGE NUMBER OF ACRES PURCHASED AND RENTED/LEASED FOR FARM EXPANSION BY AGE GROUP BETWEEN 1984 AND 1989.

<u>AGE</u>	<u>#Renters/Lessees</u>	<u>#Purchasers</u>	<u>AVERAGE ACRES</u>	
			<u>Rented/Leased</u>	<u>Purchased</u>
<25	2	1	40	90
25-29	4	0	90	0
30-34	4	1	135	80
35-39	9	0	242	0
40-44	7	0	262	0
UNDER 45	26	2	154	85
45-49	9	2	224	120
50-54	11	0	174	0
55-59	4	0	265	0
60-64	0	3	0	86
65-69	0	0	0	0
OVER 45	24	5	AVERAGE 124	188

4.2.5 Distance of Rental/Leased Parcel From Home Base

Forty-five percent of the rental/leased units by number and 44 percent by acreage were located within one mile of the operator's farm headquarters (Table 4.7). The individuals demand for rental/leased land declined the further the land was away from the home base. Thirty three percent of the rental/leased units (by number and acres) were located between 1.0 to 2.9 miles. Fifteen percent of the units (by number and by acreage) were located 3 to 5 miles and only 7 percent of the units by number (8 percent by acres) were located more than 5 miles from the home base.

Table 4.7 DISTRIBUTION OF RENTAL/LEASED UNITS AND ACRES RENTED/LEASED BY DISTANCE FROM FARM HEADQUARTERS

<u>Distance</u> (miles)	<u>Rental/Lease Units</u> *1		<u>Acres Rented/Leased</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
0.0-0.9	94	45	15,960	44
1.0-2.9	68	33	11,766	33
3.0-5.0	31	15	5,371	15
Over 5	14	7	2,817	8
Total	207	100	35,914	100

*1 A rental/lease unit was considered to be the land rented/leased from one landlord).

4.2.6 Multiple Renting/Leasing

The survey revealed that part-owners commonly rented/leased from more than one landlord. In this survey, 100 part-owners rented/leased a total of 207 parcels of land (Table 4.8). The size of

the individual contract units ranged from 8 to over 600 acres, but over 50 were 160 acres or less (Table 4.9).

TABLE 4.8 DISTRIBUTION OF NUMBER OF OPERATORS INDICATING THE NUMBER OF UNITS RENTED/LEASED

<u>Units</u>	<u>Operators Number/Percent</u>
1	35
2	32
3	23
4	10
5	0
Total	100

TABLE 4.9 DISTRIBUTION OF RENTAL/LEASED UNITS BY ACRES PER UNIT

Acres (per unit)	Rental/Leased Units	
	<u>Number</u>	<u>Percent</u>
1-40	15	7
41-80	42	20
81-120	41	20
121-160	20	10
161-200	24	12
201-240	13	6
241-280	15	7
281-320	24	12
321-360	2	1
361-400	0	0
401-440	4	2
441-480	0	0
481-520	0	0
521-560	0	0
561-600	5	2
>600	2	1
Total	207	100

4.3 Supply Characteristics

4.3.1 Relationship Between Landlord and Tenant

The majority of the part-owners were not related to the landlords. Thirty-one percent of the rental/lease contracts were kinship tenancies while 69 percent were not (Table 4.10).

Under non-kinship tenancy there is a clear preference for cash rentals/leases and also to have the contract written rather than verbal (Table 4.11). Alternatively, a larger percentage of verbal and crop-share contracts was evident where there were kinship tenancies. The method of payment (cash versus share) with relationship to landlord was statistically significant based on the Chi Square Test of Independence at the 5 percent level.

Table 4.10 DISTRIBUTION OF RENTAL/LEASED UNITS AND ACRES RENTED/LEASED BY RELATIONSHIP TO LANDLORD

<u>Relationship</u>	UNITS		ACRES RENTED/LEASED	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Kinship	64	31	11,048	31
Non-Kinship	143	69	24,866	69
Total	207	100	35,914	100

Table 4.11 DISTRIBUTION OF RENTAL/LEASED UNITS UNDER RELATIONSHIP TO LANDLORD BY FORMALITY OF CONTRACT AND METHOD OF PAYMENT

<u>FORMALITY OF CONTRACT</u>	<u>KINSHIP</u>		<u>NON-KINSHIP</u>	
	<u>NUMBER</u>	<u>PERCENT</u>	<u>NUMBER</u>	<u>PERCENT</u>
Verbal	48	75	56	39
Written	16	25	87	61
Total	64	100	143	100
<u>METHOD OF PAYMENT</u>				
Cash	21	33	105	74
Crop-share	39	61	36	25
Cash and Share	4	6	2	1
Total	64	100	143	1

4.3.2 Occupation and Residence of Landlord

Landlords in general did have a strong orientation to farming. Sixty nine percent of the landlords were retired farmers (Table 4.12). Only 10 percent of the landlords were non farmers.

Table 4.12 DISTRIBUTION OF RENTAL/LEASED UNITS BY OCCUPATION OF LANDLORD

<u>Occupation</u>	<u>Rental/Leased Units</u>	
	<u>Number</u>	<u>Percent</u>
Farmer	45	21
Retired Farmer	142	69
Other	20	10
Total	207	100

The proposition that a considerable amount of land is rented/leased from non-local landlords is supported by this survey: while 23 percent of the landlords lived on the rented/leased property and 50 percent elsewhere in the municipality, 27 percent

(the remainder) resided elsewhere in Manitoba, in another province or were foreign (Table 4.13). If this latter category is classified as absentee landlords, over one-quarter of the landlords fall into this category.

Table 4.13 DISTRIBUTION OF RENTAL/LEASED UNITS BY RESIDENCE OF LANDLORDS

<u>Residence</u>	<u>Rental/Leased Units</u>	
	<u>Number</u>	<u>Percent</u>
On the rented/leased land	47	23
Elsewhere in the Municipality	103	50
Elsewhere in Manitoba	34	16
Elsewhere in Canada	8	4
Foreign	15	7
Total	207	100

A comparison of occupation by residence of landlord is documented in Table 4.14. Retired farmer-landlords tended to reside on the rented land or elsewhere in the municipality (122 of 142 or 86 percent). It is also interesting to note that the majority of the landlords (142 of 207 or 69 percent) were retired farmers (Table 4.14).

Table 4.14 DISTRIBUTION OF RENTAL/LEASED UNITS BY OCCUPATION AND RESIDENCE OF LANDLORD

Residence	Retired			Total Units
	Farmer	Farmer	Other	
On rented/leased land	7	35	5	47
Elsewhere in Municipality	9	87	7	103
Elsewhere in Manitoba	13	18	3	34
Elsewhere in Canada	3	0	5	8
Foreign	13	2	0	15
Total	45	142	20	207

4.4 Lease/Rental Contract

4.4.1 Length of Contract

In general, the rental/lease arrangements had existed for a considerable length of time. On average, a tenant operated a unit for 7.25 years. Sixty percent of the contracts had been in effect six years or longer (Table 4.15).

TABLE 4.15 DISTRIBUTION OF UNITS BY LENGTH OF TIME A UNIT WAS RENTED/LEASED BY THE SAME TENANT

<u>Years Rented/Leased</u>	<u>Units</u>	
	<u>Number</u>	<u>Percent</u>
1-5	82	40
6-10	96	46
11-15	21	10
16-20	6	3
21-25	0	0
>26	2	1
Total	207	100

The average length of 7.25 years tends to underestimate the actual average duration of the lease/rental by not taking into account the years in the arrangement that might remain.

The length of time the land was rented/leased contrasts sharply with the length of time covered by the contract. Seventy percent of the rentals/leases in this survey were for one year (Table 4.16), but predominantly subject to continuation.

TABLE 4.16 DISTRIBUTION OF RENTAL/LEASED UNITS BY LENGTH OF CONTRACT

<u>Length of Contract (yrs)</u>	<u>Rental/Leased Units</u>	
	<u>Number</u>	<u>Percent</u>
1	145	70
2	6	3
3	45	22
4	2	1
5	9	4
Total	207	100

4.4.2 Length Of Contract Preferred

The majority of part-owners preferred a longer contract than one year. As denoted in Table 4.16, 70 percent of the rental/leased units were for one year. In Table 4.17, 92 percent of the part-owners preferred a contract longer than one year.

Table 4.17 DISTRIBUTION OF NUMBER OF OPERATORS BY PREFERRED LENGTH OF LEASE/RENTAL CONTRACT

<u>PREFERRED LENGTH</u>	<u>NUMBER/PERCENT</u>
1 Year	8
2, 3 Or 4 Years	34
5 Or More Years	58

4.4.3 Formality of Lease/Rental Contract

Over the years, the benefits of a written lease/rental contract have been greatly stressed. The written contract may specify reimbursements, conservation and cropping practices, and legal provisions. Despite the apparent benefits said to accrue from a written contract, only 50 percent of the farmers were using one

(Table 4.18). One-half of the lease/rental contracts in this study were verbal agreements.

Table 4.18 DISTRIBUTION OF RENTAL/LEASED UNITS AND ACRES RENTED/LEASED BY FORMALITY OF CONTRACT

<u>Formality</u>	<u>UNITS</u>		<u>ACRES RENTED/LEASED</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Verbal	104	50	12,495	35
Written	103	50	23,419	65
Total	207	100	35,914	100

A written contract was used more frequently on larger units; a mean of 227 acres per unit compared to 120 acres under a verbal contract. Written contracts tend to be used more frequently if tenant and landlord are not related.

A significant difference in the proportion of written contracts was observed with respect to the landlord's residence. The proportion of written contracts was higher if the landlord lived non-locally [based on the Chi-Square Test of Independence under the 5% level of significance ($X^2=5.95$, $\Phi=.10$)]. No significant difference in the proportion of oral or written contracts was observed with occupation of landlord, length of contract and number of years the land was rented/leased.

4.4.4 Method Of Payment

The most frequent method of payment used was the cash rent, accounting for 61 percent of all the arrangements (Table 4.19). Thirty-six percent were crop-share rents and 3 percent were part-cash part-share. It is also worth noting that a large majority of the

crop-share rentals/leases were between relatives and were verbal. Cash rentals/leases were more frequently written than crop-share agreements.

Table 4.19 DISTRIBUTION OF RENTAL/LEASE UNITS AND ACRES RENTED/LEASED BY METHOD OF PAYMENT

Method	<u>Rental/Lease Units</u>		<u>Acres Rented/Leased</u>	
	Number	Percent	Number	Percent
Cash	126	61	25,357	71
Crop-Share	75	36	9,787	27
Part-Cash Part-Share	6	3	770	2
Total	207	100	35,914	100

Forty-three percent of the part-owners preferred the fixed cash and flexible cash rent method of payment (Table 4.20). Fifty seven percent preferred fixed share and flexible share rent payment. Also, the percentage of operators who preferred a flexible over a fixed contract are 25% (for cash rent) and 29 % (for share rent)

Table 4.20 DISTRIBUTION OF NUMBER OF OPERATORS BY PREFERRED METHOD OF PAYMENT

<u>Method</u>	<u>Number</u>	<u>Percent</u>
Fixed cash	34	34
Flexible cash*	9	9
Fixed share rent	43	43
Flexible share rent*	14	14
Total	100	100

* Dependent upon yield and prices of inputs and outputs.

4.4.5 Lease/Rental Provisions

A rental/lease agreement, regardless of the formality, usually prescribes specific obligations and prohibitions that a landlord and tenant have agreed to abide by. The contents of the contract can either be assembled by the participants themselves or contractual forms can be acquired from a lawyer or from a local agricultural representative. The rent charged and date of termination are examples of the essentials often covered in a rental/lease contract. The contents of the contract also may be expanded to provide the opportunity for landlords and tenants to take concrete steps in controlling specific practices and specifying uses of agricultural land.

Few part-owners in this study had any form of tacit agreement regarding practices on rented/leased land. Only 11 percent of the landlords made some decisions with respect to the operation of their land. Even a smaller proportion (4 percent) had provisions that specified cropping procedures and conservation practices.

To determine what tenants preferred, respondents were asked to choose from a list of seven items or provisions which are often associated with a rental/lease contract (Table 4.21).

Table 4.21 DISTRIBUTION OF PERCENT OF OPERATORS BY THEIR PREFERENCE FOR SPECIFIC PROVISIONS IN THE RENTAL/LEASING CONTRACT

<u>Preference For</u>	<u>Percentage Of Operators</u>
Written Contract	86
Verbal Contract	14
Periodic review of Contract	48
Compensation for land improvements made by tenant	74
Adequate notice of renewal or cancellation	88
Provisions regarding rent adjustments	21
Option to buy	79

Most preferred a written rental/lease contract, adequate notice of renewal or cancellation and an option to buy. The least preferred option was the verbal contract as only 14 percent of the operators chose this provision.

4.5 Rent Rates

4.5.1 Distribution of Rent Rates Per Acre

One of the most important aspects of a farmland rental/lease arrangement is the rent rate. The rent paid for agricultural land is expected to reflect current and expected profitability. The distribution of rent rates per acre in this survey area in 1989 ranged from \$15 to \$70 per acre. However, the bulk of the rental/leased units were priced between \$30 and \$60 per acre (Table 4.22). The reason for the extreme range between the rent rates is the low rent which is often associated with kinship tenancies.

Table 4.22 DISTRIBUTION OF RENTAL/LEASED UNITS BY RENT PER ACRE

<u>Rent per acre \$</u>	<u>RENTAL/LEASED UNITS</u>	
	<u>Number</u>	<u>Percent</u>
\$1-15	2	2
\$16-30	5	4
\$31-45	51	40
\$46-60	41	33
\$61-75	27	21
Total	126	100

4.5.2 Association Between Rent And Land Values

The land values estimated by the farmers who rented/leased land varied to a large extent from 400 to 1200 dollars per acre (Table 4.23). The largest proportion however, fell between 600 and 800 dollars per acre (39 percent).

Table 4.23 DISTRIBUTION OF ESTIMATED LAND VALUES

<u>Estimated land value per acre (\$)</u>	<u>Number of units</u>	<u>Percent of units</u>
0-200	0	0
201-400	9	4
401-600	68	34
601-800	81	39
801-1000	42	20
1001-1200	7	3

4.5.3 Association Between Rent And Crop Use

An association expected to exist is that between rent rates and crop use (Table 4.24). Only the primary land parcels with a

single crop use were included in this analysis. A unit with a single crop use more accurately relates rent to crop use than if several crops were assigned the same rent rates. Units with higher value crops such as sugarbeets and potatoes rented/leased at a relatively higher price than units where lower value crops were grown. The average rent was \$52.65 per acre.

Table 4.24 AVERAGE FARMER ESTIMATED LAND VALUES AND RENT BY CROPUSE

<u>Crop</u>	(\$ Per Acre)	(\$ Rent Per Acre)
	<u>Weighted Land Values</u>	<u>Weighted Rent Rates</u>
Sugarbeets	809	51.56
Potatoes	811	56.25
Flax	775	44.00
Spring wheat	663	36.42
Peas	625	N/A
Canola	600	40.00
Corn grain	566	N/A
Corn silage	520	N/A

*Crops not represented is simply due to lack of being primary crops by farmers in survey.

Lower rents are often associated with low land values while high rents are usually associated with high land values. Estimated land values under \$600 in this survey had a weighted rent value of \$48.10 per acre, while estimated land values over \$600 per acre had a rent value of \$55.27 per acre. Rent as a percentage of land value ranged from a low of 2.76 percent to a high of 7 percent. The average was 4.38 percent.

In this survey, a weighted rent value for peas and corn could not be obtained. This is due to the fact that none of the individual farmers perceived that these were their primary crops.

Chapter Five

Soil-Quality Maintenance Practices And Productivity

5.1 Introduction

The intent of this chapter is to examine the effect of renting/leasing on land use on crop productivity. Also investigated will be whether or not any relationship exists among the characteristics of the rental/leasing market, as described in the previous chapter, and farm practices which maintain or enhance soil productivity. The outcome of the analysis will then demonstrate if renting/leasing has any effect on soil productivity and subsequently on crop productivity compared with operator-ownership in the area under investigation. If a difference can be established, it is likely due to a difference in tenureship. On the other hand, certain characteristics of the rental/leasing market could also affect the difference in farm practices and crop productivity. If this is the case, it may be possible to correct deficiencies in the prevailing rental/leasing system for those characteristics which are subject to remedy.

In this Chapter the following aspects related to tenure are analyzed:

- 1) A comparison of crop selection between owned and rented/leased land and its effect on soil productivity;

- 2) A comparison of agricultural practices between owned and rented/leased land;

3) An investigation of the effects of a change in tenure status on farming practices; and

4) An investigation of the effects of other characteristics of the rental/leasing market on farm practices.

5.2 Crop Selection On Owned And Rented/Leased Land And Its Effects On Productivity

A similar range of crops was grown on both the owned and rented/leased land. The various crops were ranked (approximately) in descending order from good to poor with respect to their ability to inhibit erosion and improve soil productivity (Table 5.1)

Table 5.1 NUMBER OF ACRES OWNED AND RENTED/LEASED, BY CROP

<u>Crop</u>	<u>Owned Land</u>		<u>Rented/Leased Land</u>	
	<u>Acres</u>	<u>Percent</u>	<u>Acres</u>	<u>Percent</u>
Pure Alfalfa	340	1	0	0
Alfalfa Mixture	560	2	5	0
Winter Wheat	726	2	800	2
Oats & Barley	2,405	8	594	2
Spring Wheat	12,750	42	8,055	22
Flax	2,574	9	1,574	4
Canola	2,064	7	1,120	3
Grain Corn	985	3	1,671	5
Corn Silage	240	1	820	2
Peas	2,150	7	2,492	7
Beans	356	1	1,965	6
Lentils	1,410	5	1,640	5
Sunflowers	350	1	1,213	3
Sugarbeets	1,804	6	10,370	29
Potatoes	1,346	5	3,520	10
Other	56	<1	80	<1
Total	30,116	100	35,914	100

The greatest single use of rented/leased land by part-owners was for sugarbeets, at 29 percent. Spring wheat and potatoes followed at 22 and 10 percent respectively. In aggregate, 0 percent of the rented/leased land was allocated to sod crops (pure alfalfa and alfalfa mixture). Sixty-seven percent was in row-crops (grain corn, corn silage, peas, beans, lentils, sunflowers, sugarbeets and potatoes) and a total of 33 percent in grains and oilseeds (winter wheat, oats and barley, spring wheat, flax and canola). By comparison, crop acreage on owned land ran to 68% in grain and oilseeds, 29% in row crops, and 3% in permanent hay and forage.

In summary, comparing owned and rented/leased land, there is a reversal of land use. Owned land, with 68 percent in grains and oilseeds, compares with 67 percent in row-crops on rented/leased land. This was found to be statistically significant [significant at the .001 level by a two tailed t-test (t value =6.50)].

5.3 Agricultural Practices On Owned And Rented/Leased Land

5.3.1 Cropping Practices

In the following section, six agricultural practices which are considered to be of importance are examined on owned and rented/leased land. These practices tend to have long-term consequences. The purpose of this analysis is to denote how tenure affects agricultural practices. The study does not, however, quantify the extent to which a particular practice is undertaken.

Part-owners were asked to indicate whether or not they performed the annual agricultural practices on owned and on rented/leased land (Table 5.2). According to the table, a significant

difference in annual agricultural practices is evident between owned and rented/leased land.

Table 5.2 NUMBER OF OPERATORS INDICATING FARM PRACTICES ON OWNED AND RENTED/LEASED LAND

<u>Farm Practices</u>	<u>On Owned Land</u>		<u>On Rented/Leased Land</u>	
	<u>Number/Percent</u>		<u>Number/Percent</u>	
	Yes	No	Yes	No
Weed Control	100	0	94	6
Fertilize	100	0	95	5
Rotation	98	2	67	33
Control Erosion	85	15	63	37
Plant Windbreak	71	29	14	86
Irrigate	12	88	0	100

For some practices, however the difference in performance between the two tenure forms was small, but nevertheless important. Two cases of monoculture on owned land as compared to 33 percent on rented/leased land are documented.

Despite the fact that fertilizing and weed control were practised by all owners and by almost all renters/lessees, there is nevertheless a difference in their application between the groups. When asked if they use more fertilizer and weed control on owned vis-a-vis rented/leased land, 84 percent stated yes while only 16 percent claimed they use the same amount of these two inputs on both. Variations in erosion suppression were also noted. Eighty-five percent of the individuals used some form of erosion control (either strip cropping, minimum till, zero till etc) on their land as opposed to only 63 percent on the rented/leased land.

There is also a difference in respect to the planting of windbreaks. Twelve percent of owners had planted windbreaks on their own land while none planted on rented/leased land.

5.4 Soil Samples

The number of occasions soil samples were taken in 1988-1989 was higher on owned land than on rented/leased land (Table 5.3).

Table 5.3 NUMBER OF OCCASIONS SOIL SAMPLES WERE TAKEN ON OWNED AND RENTED/LEASED LAND IN 1988-1989

<u>Occasions</u>	<u>Owned Land</u>		<u>Rented/Leased Land</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
0	9	9	86	42
1	23	23	71	34
2	68	68	50	24
Total	100	100	207	100

Only 58 percent of the part-owners undertook soil tests on the rented/leased land in 1988-1989, while 91 percent of these same individuals did so on their own land.

5.5 Change In Tenure Status

5.5.1 Impact Of Change In Tenure Status On Annual Cropping Practices

In this section the effect of a change in tenure status from renter/lessee to operator ownership is investigated. Questions were asked whether or not the tenant would intensify/improve farm practices if he purchased the land he now rents (Table 5.4). Responses to the questionnaire indicate more intensive management

would occur. In particular, broadening of the crop spectrum (73 percent), systematic rotation (62 percent) and erosion suppression (47 percent) would be intensified. Other practices such as augmented fertilization (25 percent), planting of windbreaks (31 percent) and weed control (14 percent) were anticipated if ownership of the land was achieved.

Irrigation utilized by only 2 percent was the only practice in which little expansion was expected to be undertaken. Expansion of a practice may refer to expansion of a practice which already occurred under rental/leasing, but it also may indicate initiation of a practice under operator-ownership which was not undertaken under renting/leasing. For example, 95 percent of operators on rented/leased land use commercial fertilizer to some extent. Two of the 5 percent that did not, would have if they owned the land they now rented/leased. Thirty-three percent of the operators did not rotate crops on the land that was now rented/leased. However, if their tenant status was changed to ownership, 88 percent of these individuals would undertake crop rotation. As to erosion suppression, 37 percent of the tenant farmers stated they made no systematic attempt at it, whereas 13 percent of these 37 would change to utilizing erosion control if they owned land they now rent.

Table 5.4 **ANALYSIS OF OPERATORS INDICATING
INTENSIFICATION OF PRACTICES IF
RENTED/LEASED LAND WAS PURCHASED**

Farm Practice	Intensification	No Intensification
	Number/Percent	Number/Percent
Fertilize	25	75
Weed Control	14	86
Rotation	62	38
Erosion Suppression	47	53
Plant Windbreaks	31	69
Irrigate	2	98
Broaden Crop Spectrum	73	27

In the case of erosion suppression, 37 tenant farmers who employed this practice under their rental/leasing agreement would do more if they purchased the land.

5.5.2 **Impact Of Change In Tenure Status On Capital Expenditures**

Table 5.5 presents data on the number of part-owners who indicated a need for capital expenditures for erosion suppression, draining and clearing on the land rented/leased.

TABLE 5.5 **THE NEED FOR CAPITAL EXPENDITURES ON
RENTED/LEASED LAND**

<u>Expenditures On</u>	# Responding	Need For Expenditures	
		<u>Number/Percent</u>	
		Yes	No
Erosion Suppression*1	100	74	26
Drainage*2	100	41	59
Clearing*3	100	2	98

#*1 Expenditures on windbreaks, chemicals, etc. in order to facilitate transition to minimum tillage.

#*2 Expenditures on drainage to facilitate runoff.

#*3 Stone, fence, stump removal etc.

A large percentage (74 percent) of operators indicated a perceived need for expenditures on erosion suppression. Forty-one percent of operators stated a need for intensified drainage. Only two percent of the operators felt that expenditures on clearing were in order.

Table 5.6 presents data on expected expenditures if the owner-operator continued to rent the same parcels of land for the next five years, in comparison to purchase. For each of these three categories of presumed capital expenditures, few of the part-owners who indicated a need for land improvements expected that these expenditures would be undertaken by themselves and/or the landlords if renting/leasing continued for the ensuing five years.

TABLE 5.6 **EXPECTED EXPENDITURES ON RENTED/LEASED LAND OVER THE NEXT FIVE YEARS**

	<u>#Of Operators</u>	<u>EXPENDITURES TO BE UNDERTAKEN IN ENSUING 5 YEARS</u>			
		<u>By tenant or landlord if renting/leasing were to continue</u>		<u>If land was purchased purchased by tenant</u>	
		<u>Number/Percent</u>		<u>Number/Percent</u>	
		Yes	No	Yes	No
Erosion suppression	100	14	86	47	53
Drainage	100	9	91	14	86
Clearing	100	2	98	2	98

In the event of the rented/leased land being purchased, a significantly larger percentage of part-owners would expect to undertake capital works expense within the ensuing five years. If the land were purchased by the tenant, forty-seven percent of

renters/lessees would undertake capital expenditures on erosion control as compared to fourteen percent if the land continued to be rented/leased. The same holds true with respect to drainage; fourteen percent if the land was purchased compared to nine percent if the land was continued to be rented/leased.

Economic factors were commonly cited as reasons by those who did not expect to undertake ameliorative expenditures with respect to the land. These included "high interest rates", "too expensive in general" or "landlord is uninterested". In all, it is clearly indicated from the results that a change in tenure status from renter/lessee to ownership would have a significant effect on intended land improvement. Fifty-four percent of those operators who indicated a need for land improvement works, would make investments if the land were purchased as compared to only 21 percent making improvements if the land were to be rented/leased for the ensuing five years.

5.6 Effect Of Characteristics Of The Rental/Leasing Market On Farm Practices

The analysis to this point presents strong evidence that tenure form influences land use and productivity potentials. This section will analyze rental/leasing market on farm practices. The objective is to relate characteristics of the rental/leasing system decision-making by the tenant in terms of maintaining and/or improving soil productivity. The establishment of cause:effect relationships may suggest possible ways of amending the prevailing system by

correcting those characteristics which are land-debilitating but subject to change.

The following will pay indepth attention to the characteristics of the rental/leasing market and the rental/leasing contract. All part-owners' responses will be in this analysis, but only the primary contract (considered to be the largest parcel rented/leased from one landlord) as denoted by the interviewees will be examined. The analysis will employ the non-parametric Chi-square test.

The Chi-square test is used to determine associations among market characteristics and farm practices. An association will be reported by a corresponding phi-coefficient which can be found in tables 5.7-5.9. The entries in the table are recorded on that row of a 'pair' showing the highest practice frequency. For example, crop rotation is practiced more frequently on land continuously rented/leased for eight years or more by the same operator than on land rented/leased for shorter periods. In a number of instances the Chi-square test could not properly be used, for example if a cell has an expected frequency count of less than five.

5.6.1 Demand Characteristics

A larger percentage of dairy, beef, poultry and swine farmers as a group applied manure to rented/leased land than did farmers who considered themselves primarily cash-crop farmers. Only two percent of the cash-crop farmers who also were involved with cattle and/or swine applied manure where as 50 percent (6 out of

12) of the farmers from the first group applied manure to the rented/leased land.

The practice of manuring occurred more frequently on land rented/leased close to the home base (less than 1 mile from home base). Eighty-three percent (5 out of 6) of these operators fell into this category, as compared to 17 percent (1 out of 6) who spread manure on land beyond that radius.

Finally, the longer the tenure period (8 years or more) the more tenants practised crop rotation. Twenty-three percent of the part-owners (16 out of 67) whose tenure spanned 7 or fewer years had practiced rotation, compared to 78 percent of the operators (18 out of 23) whose tenure spanned 8 years or more (significant at the .10 level, $\Phi=.12$; table 5.7).

The use of broadcast-seeded crops compared to row crops was also greater in cases of tenure spanning 8 years or more ($\Phi=.11$ at the .01 level). It should be pointed out that this was the only instance in which the crop (broadcast versus row) could be related to market characteristics.

TABLE 5.7 **DEGREE OF ASSOCIATION BETWEEN DEMAND CHARACTERISTICS OF THE RENTAL/LEASING MARKET AND FARM PRACTICES(1)**

<u>Characteristic</u>	<u>Crop Rotation</u>	<u>Manuring</u>	<u>Fertilization</u>	<u>Weed control</u>	<u>Erosion control</u>
<u>Demand</u>					
Farm type					
Cash-crop	-(2)				
Group (3)		.13*	-	-	
N.S					
Distance					
0-3 miles	N.S.(4)	.21**	-	-	N.S.
> 3 miles					
Years continuous tenure					
1-7 Years			-	-	N.S.
> 8 years	.12*	N.S			

* * Significant at the .01 level.

* Significant at the .05 level.

(1) Includes only the primary landlord agreement as indicated by the part-owner.

(2) - Chi-square value could not be computed.

(3) Group includes non cash-crop farmers such as dairy, beef, poultry and swine.

(4) N.S. non significant.

5.6.2 Supply Characteristics

Crop rotation and manuring practices were more intensive in cases of tenants being related to their landlords. Eighty-eight percent of the manuring occurred within tenancies involving kinship. The small contingent involved in non cash-crop farming makes it difficult to arrive at compelling conclusions. Still, 85 percent of tenants related to the landlord (34 out of 40) also practised crop rotation, as compared to 49 percent (33 out of 67) of those not related.

Caution is advised in interpreting these associations, since some characteristics could be mutually associated. For example, if an association were found between a long term rental/lease-contract and crop rotation and one between kinship and crop rotation, causal determination becomes difficult. Apparently, however, tenant:landlord kinship, on balance, exerts a positive influence on contract continuity.

Pursuing this theme, the farm type, distance, tenure history, formality of the contract, length of assumed tenure and details of rental/lease provisions were examined for an association with kinship and non-kinship tenancies. Statistically, no significant associations were found between these six characteristics and the landlord-tenant relationship.

No statistically significant association between the occupation and residence of landlord and certain farm practices could be established. Nevertheless, on a percentage basis almost all practices were performed more frequently under a rental/lease agreement with a non-farmer landlord and under agreements with landlords residing non-locally. For example, the difference percentage-wise for crop rotations is 76 versus 58 when landlords were non-farmers compared to farmers. The difference for fertilizer use percentage-wise is 99 versus 91, for weed control, 96 versus 92 and for erosion suppression, 72 versus 54.

With respect to the place of residence of the landlord, fewer instances of practices of crop rotation, for example, occurred on the land whose owner resided locally (on the rented/leased land or elsewhere in the municipality) than non-locally (elsewhere in

Manitoba, Canada or outside of Canada. The same held true for fertilizing, weed control and erosion control. For example, crops were rotated on 73 percent of the units rented/leased from non-local landlords compared to 65 percent in the case of local landlords. For fertilizing, weed control and erosion control the percentage differences respectively are: 100 versus 95, 100 versus 94 and 52 versus 49.

TABLE 5.8 **DEGREE OF ASSOCIATION BETWEEN KINSHIP CHARACTERISTICS WITHIN THE RENTAL/LEASING LAND SUPPLY AND FARM PRACTICES(1)**

<u>Characteristic</u>	<u>Rotation</u>	<u>Manuring</u>	<u>Fertilization</u>	<u>Weed control</u>	<u>Erosion control</u>
<u>Supply</u>					
Relationship					
-Kinship	.15*	.13*	— (2)	—	N.S.(3)
-Non-kinship					

*Significant at the .05 level

(1) Includes only the primary landlord agreement as indicated by the part-owner

(2) — Chi-square value could not be computed

(3) N.S. non-significant

It should be noted that the existence of written and longer term rental/lease contracts (contracts longer than 1 year) was higher in the case of landlords living non-locally and landlords being non-farmers.

5.6.3 **Rental/Lease Contract**

Problems in the renting/leasing of land are frequently attributed to the form and content of the rental/lease contract. It is

not difficult to understand the importance of the written and longer term contract in ameliorating the problems intrinsically related to renting/leasing. The fact that a contract is written does not in itself improve a rental/leasing agreement. The importance of a written contract can be attributed to its contents which usually give more attention to detail than verbal ones. A lack of detail, together with memory failure, can lead to disagreements in the case of verbal rental/leasing contracts.

An investigation of the impact of the rental/leasing contract on farm practices is hampered by the fact that there is little variation in contract terms in the area investigated. It often becomes impossible to use the statistical test (Chi-square), or in cases where the test can be performed, it becomes difficult to find statistically significant relationships.

Under the written rental/leasing contract, specific attention to erosion suppression was greater. Fifty-one percent of the written contracts (19 of 37) had erosion control clauses compared to 41 percent (26 out of 63) of the verbal contracts. This was found to be statistically significant (Table 5.9). It is not known, however, whether these practices were stipulated in all of the rental/leasing agreements of those who practised them.

Percentage-wise, crop rotation was more prevalent under written than under verbal contracts. Sixty-two percent of the individuals operating under a written rental/leasing contract indicated they rotated crops as compared to 48 percent under a verbal contract.

As far as fertilization and weed control is concerned, 100 percent (37 out of 37) of the individuals with written rental/leasing contracts applied fertilizer in comparison to 92 percent (58 out of 63) under a verbal contract while 100 percent of the individuals with a written contract and 90 percent (57 out of 63) with a verbal contract applied some form of weed control.

Erosion suppression measures were more prevalently applied on rented/leased land operated under a 3-5 year contract than under a year-to-year arrangement. Erosion suppression was applied in 81 percent of the cases (17 out of 21) compared to 38 percent (30 out of 79) where a one-year contract existed. The result given here is statistically significant [Chi-square value .11 (Table 5.9)].

In many instances the Chi-square test could not be properly used since the number of part-owners operating under specific rental/lease provisions was too small. Despite this, the majority of operators whose contracts stipulated such provisions undertook more annually recurring management practices on rented/leased land than those without such provisions.

A statistically significant association emerged between written contracts and longer term arrangements of 3-5 years ($\Phi=.26$ and is significant at the .001 level). Twenty-five percent of the 1-year contracts were written (20 out of 79) compared to 81 percent (17 out of 21) of those with a 3-5 year term.

There appears to be a relationship between written contracts and the degree of detail in contract provisions. When specific management provisions exist, they are more often in a written form.

**TABLE 5.9 DEGREE OF ASSOCIATION BETWEEN
CHARACTERISTICS OF THE RENTAL/LEASING
CONTRACT AND MANAGEMENT PRACTICES (1)**

<u>Characteristic</u>	<u>Crop</u> <u>Rotation</u>	<u>Manuring</u>	<u>Fertilization</u>	<u>Weed</u> <u>control</u>	<u>Erosion</u> <u>Control</u>
<u>Rental/lease Contract</u>					
Formality of contract					
-Verbal					
-Written	N.S.(3)	N.S.	_(2)	_	.15*
Length of contract					
-1 Year	.14**	N.S.			
-3-5 Years			_	_	.11*

* Significant at the .10 level

* * Significant at the .01 level

(1) Includes only the primary tenancy agreement as indicated by the part-owner.

(2) _ Chi-square value could not be computed.

(3) N.S. non-significant

CHAPTER 6

SUMMARY, IMPLICATIONS AND RECOMMENDATIONS

6.1 Summary

Analysis of Manitoba's farmland tenure patterns indicates that the trend to part-ownership by operators is on the increase. As of 1986 it was 41.4 percent (source: Canada Census 1986). Considering the high cost of capital, coupled with the need to rationalize farm size, the trend towards land rental/leasing as a means of obtaining usufruct rights, will likely continue.

The purpose of this study was to analyze the farmland rental/leasing market in a selected area of southern Manitoba, and to determine whether agricultural practices, crop productivity and inputs which affect soil quality differed as between land that was owner-operated and land operated under rental/lease agreements by the same operator group. Characteristics of the rental/leasing market were also investigated. The analysis focused on the part-owner tenure group. The major theme of the study was the examination of the premise that tenancy is associated with resource depleting cropping practices and lower levels of inputs.

Insight into this particular rental/leasing market proved to be of much use insofar as it revealed demand and supply characteristics as well as providing insight into the nature of contracts presently in place. The following is a general overview of the rental/leasing market as determined by this study. The results are tested with respect to the initial hypotheses. The points that need explanation will be discussed.

On the demand side the following information was derived:

- 1) the average total farm acreage within the survey was 657;
- 2) 54 percent of the land was rented/leased;
- 3) the ratio of rented/leased acreage to total acres farmed was highest for cash-crop farmers at 57, percent with all other categories much below that level ranging from 11% to 25%.
- 4) owned land, as a proportion of total farm acreage, increased over the lifetime of the part-owner. This supports the hypothesis that the individual operator may gradually want to buy all the land he farms, as his financial situation strengthens over time. Also, when the part-owner approaches retirement, he will tend to scale down his farm operation by cutting back on his rented land first.
- 5) sixty-one percent of the part-owners had increased their farm size over the preceding five years, 13 percent decreased and 26 percent reported no change;
- 6) of the acres added in the preceding 5 years, 92 percent were acquired by rental/lease and 8 percent through purchase. This result denotes the present importance of rented land;

7) during the preceding 5 years, seventy-two percent of operators under 45 years of age had expanded their farms as compared to 48 percent of the operators over 45 years of age; and

8) the demand for rental/leased land by any individual declines sharply beyond a 1 mile radius from the home base. The distance that must be travelled to a rental/leased unit is important if the land must be worked with the same equipment as the owned land. Overall, 45 percent of the rental/leased units by number and 44 percent by acreage were located within one mile of the operator's farm headquarters. Thirty-three percent were located between 1.0-2.9 miles, 15 percent between 3 to 5 miles and 7 percent were located more than 5 miles from home base.

With respect to the supply characteristics, the following were noted:

1) Thirty-one percent of the operators were related to the landlord while 69 percent were not;

2) higher proportions of written and cash rentals/leases occurred when the landlord was not related to the tenant;

3) a larger percentage of verbal and crop-share contracts was evident where the tenant and landlord were related.

4) Sixty-nine percent of landlords were retired farmers, while 10 percent were non-farmers. This supports the hypothesis that many older farmers may use the renting/leasing of their land as a tool for sizing down their operations;

5) twenty-seven percent of the landlords may be classified as absentee landlords; and

6) eighty-six percent of the retired farmer landlords resided on the rented/leased land or elsewhere in the same municipality.

Rental/lease contracts revealed that:

1) On average a tenant had operated a rental/lease unit for 7.25 years;

2) sixty percent of the contracts had been in effect for 6 years or longer. Despite a low incidence of long-term contracts, there appears to be a significant amount of stability in the landlord-tenant relationship;

3) ninety-two percent of the part-owners preferred a contract longer than 1 year, while 70 percent of the actual working contracts were for 1 year. According to this data, it is apparent part-owners were uneasy about the current length of their lease/rental contract. However, in general, verbal contracts were assumed to be continuing unless specifically terminated by either party.

4) Fifty percent of the renters/lessees were subject to written contracts;

5) written agreements were more prevalent on larger rental/leasing units;

6) sixty-one percent of all the contracts specified a cash rent, 36 percent an agreed crop-share and 3 percent a part-cash/part-share payment. The majority of the crop-share contracts were between relatives and were verbal. One would expect crop-share contracts to be in a written form, since the details of cost revenue sharing can be complicated;

7) eighty-six percent of the tenants expressed a preference for a written contract;

8) Eleven percent of the landlords were to some degree involved in land-management decisions. It appears that cropping practices on rented/leased land are primarily the responsibility of the tenant. It is precisely in this area that a potential threat exists regarding soil erosion and loss of soil productivity.

9) The average rent within the preview of this study was \$52.65 per acre/year. Land used for the production of sugarbeets and potatoes commanded the highest rentals/lease fees.

Rental/leasing theory provides a basis for analysis of tenancy practices. The theory in general concludes that there is inefficient allocation of resources from the national economic point of view if

land is operated under a lease/rental agreement. A frequent criticism of leasing/renting is that focussing on short-term

contracts. The essential point in this argument is that a tenant must be secure in the knowledge that if he improves the land, he will benefit from his investment. In other words, improvements made to the rented/leased property by the tenant must be protected, since if they are not, he will be discouraged from making the appropriate revisions or adjustments.

As this study progressed, several significant associations emerged. The first hypothesis as stated in section 1.4 (part a) states that superior management would be associated with owned land. A comparison of farm practices on owned versus rented/leased land corroborated this theory. A higher proportion of broadcast-seeded crops prevailed on owned land and soil-depleting row crops on rented/leased land. Row crops, in contrast to sod crops and to a greater extent than grain and oilseed crops, tend to deplete soil fertility and favor soil erosion(Laflen, 1978). Row crops also tend to require greater applications of chemical fertilizers and pesticides. Although in general the row crops are capable of producing higher returns in the short term than other crops, a farmer's desire to maximize returns by relying exclusively on continuous row-cropping could seriously diminish the future productivity of land. An increase in current row-cropping, particularly of a continuous nature, may act to decrease future net revenues by increasing future marginal costs. This however, is not a concern of the individual who rents the land since his tenure of the land may be short and options to renew

limited. Responsibility for the well-being of the land resource falls squarely on the shoulders of the landlord. It is important to note that in the short term the returns associated with sod crops and grain/oilseed crops may be lower than those from row crops. However, these lower revenues can be offset to some extent by improvements in productivity, lower current production costs, and, potentially, higher value when the land is ultimately sold.

Soil testing was undertaken more frequently on owned than rented/leased land. Ninety-one percent of part-owners had soil samples tested (once or twice) on their owned land during 1988-1989 as compared to only 58 percent on the land they rented/leased. Obviously, part-owners have more closely monitored their crop nutrient requirements on owned than on rented/leased land. Higher crop yields were also noted on owned land as compared to rented/leased land as indicated by part-owners' perception of their productivity.

With respect to hypothesis 1 (part c) in section 1.4, owned land in contrast to rented/leased land, would receive higher levels of inputs relating to soil improvements, given similar physical conditions. As anticipated, part-owners reported a higher incidence of crop rotation, manuring, fertilizing, weed control and erosion suppression on their owned than on their rented/leased land, albeit the latter was perceived by many respondents to be in need of these practices to a greater extent than that which prevailed. This analysis also shows that a practice such as rotation of crops whose effects are mainly of a long-term nature are more likely to be neglected in rental/leasing arrangements than fertilizing and weed

control. Moreover, with ownership, implementation of systematic crop rotation is more prevalent on those lands where such practices are currently not undertaken.

The amount of tenant farmers (37) who employed erosion suppression methods under their rental/leasing agreement would do more if they purchased the land. This may be attributed to the fact that those who have experienced the benefits of erosion suppression are even more inclined to adopt them under ownership rights. The benefits of erosion suppression may not be so easily discerned by non-practitioners than the benefits of rotation and fertilization. However, it also reveals that the overall attitude toward the land is a material one relating to conventional, monetized values, with little or no component of an overriding acceptance of implied obligations in the realm of stewardship.

Seventy-four percent of the operators perceived a need for expenditures on erosion suppression, coupled with 41% of the operators stating a need for intensified drainage. These practices are interconnected, for if erosion suppression mechanisms (even those which do not cost money such as simply leaving standing stubble) were in place, there might be no need for outlays on drainage. Little or no water ponding would occur if the focus were on suppression. It is obvious farmers may not have a clear understanding of what is involved in erosion suppression. This question was asked purposely in the questionnaire in order to investigate what owner-operators actually viewed as essential inputs to effectively curb erosion by water and wind.

The second hypothesis referred to in Section 1.4 is that a change in status from tenant to owner would result in increments to the level of sustaining and/or ameliorating inputs on land now rented/leased. Crop rotation and manuring, and to a lesser extent, clearing would increase if the rented/leased land were purchased by the tenant. It must be kept in mind that these changes refer to farmers' intentions if their tenure status changed. The high cost of land and inputs currently characteristic of the farming sector, coupled with low prospective returns on investment, will likely dictate a status quo to these part-owners in respect to imminently changing their tenure status.

The impact of tenure on investment decisions can possibly be explained by the fact that under a short term rental/leasing arrangement with limited option to renew, the tenant's resources are likely to be allocated to those expenditures which yield revenue in the present or near future. By contrast, investment in erosion control, draining and clearing are perceived as yielding differed returns. The uncertainty of continued access and absence of compensation clauses, encourage the tenant to forego capital expenditures on rented/leased land and to pursue only those activities that yield quick returns even if the expenditures are minimal.

The absence or low level of investment undertaken by landlords has often been blamed on absentee landownership. In the area under investigation this is about 27 percent. Why is it that the remainder of the landlords do not undertake land improvement investments in those cases where the tenant would if he owned the

land? It appears that many landlords are out of touch with the immediate needs of the land they are renting/leasing out.

It is possible that there is a lack of funds to carry out these improvements. However, if more appropriate management techniques were utilized initially, these expenditures would be minimal and benefits would generally accrue. The rental/leasing market imperfections appear to act as a disincentive to the average landlord, and this leads to abuse of the land in the long run.

A major goal of this study was to assess the degree to which factors associated with the rental/lease contract affect management intensity on rented/leased land. All indications are that long-term lease/rental contracts with appropriate rental/lease provisions would lead to better husbandry of the soil than short-term contracts and the absence of conservation-oriented provisions. In most cases, the statistical test of this hypothesis could not be performed due to the low degree of variability encountered. Despite this fact, where resource-conserving provisions were stipulated, tenants moved toward more intensive management compared to those operating in the absence of such provisions. Where a statistically significant association could be made, the association was between long-term rentals/leases and more intensive management practices.

In summary, problems related to soil husbandry on rented/leased land can be ameliorated by lease/rental contracts containing appropriate provisions.

6.2 Implications

Within defined legal constraints, a tenure system lays down the rights and obligations of resource users. In exercising tenure rights, it is assumed that individuals assume responsibility for preserving the productive capacity of the land in the interests also of future tenants. Leasing/renting arrangements which foster inoptimal resource utilization and soil deterioration are to be avoided. Basic to the entire issue is an attitude toward stewardship which recognizes an obligation toward present and future generations in management of the land.

Implicit in the loss of productivity from Manitoba's rented/leased farm land are individual and societal values. The broad social significance is underscored by a growing global population whose future demand for food and fibre may be expected to increase substantially. A loss of future productivity due to compromised potentials is more serious for society in the long run than for the individual land user who may have a short planning horizon.

As farmers continue to resort to rented/leased land as a means of rationalizing their operations, careful monitoring of our current tenancy practices is suggested. Given the increasing trend towards reliance on rental/leasing, particularly within the commercial farming sector, the organizational character of tenancy arrangements is posited to have a significant bearing on the present and future productivity of agriculture. The findings of this study show lower realized productive potential on rented/leased land as

compared to that on owned land. In the long run, this could severely impinge on the success of policies which attempt to improve Canada's agricultural production base. Tenancy must be assigned an appropriate significance. Until tenancy is "orchestrated" into a resource-conserving and sustaining role, problems in this dimension of the agricultural sector will persist.

6.3 Recommendations

A solution to the present tenancy problem requires the development of a structure which makes the tenant answerable for the consequences of improper land management.

There is an urgent need for increased tenure security as well as for lease/rental contracts with specific resource-conserving and sustaining provisions. Prevailing tenancy customs tend to neglect these concerns. Adjustments to lease/rental contracts must be fair to both parties concerned or adjustments will be resisted. It is obvious from this study's findings that revised tenancy agreements could provide the basis of benefit to the tenant and landlord alike.

One approach might entail the use of a risk-sharing contract in which the landlord in actuality hires the tenant to manage his land. This may benefit both the landlord and the tenant since the land use may be jointly controlled, and supplemental inherent tax advantages accrue to the landlord without detriment to the tax liability of the tenant. The tenant would continue to have access to the land without the financial burden of acquisition, and would obtain an income at least equivalent to that pertaining to hitherto prevailing forms of tenancy.

Alternatives must be promoted in the rental/leasing market or a continuing decline in production on rented/leased land may be expected to occur. In the context of concerns with respect to returns on investment, rented/leased land will remain subject to disproportional stress, unless and until contractual arrangements inherently capable of fostering resource-conserving and sustaining stewardship are implemented.

Bibliography

- [1] Adams, Dale W. and Rask, Norman. "Economics of Cost-Share Leases in Less Developed Countries." American Journal of Agricultural Economics. Vol. 50, No.4, November, 1968, pp.935-942.
- [2] Agriculture Canada. Challenge for Growth: An Agri-food Strategy for Canada. Discussion paper, Ottawa, 1981.
- [3] Allen, Franklin. "On the Fixed Nature of Sharecropping Contracts." The Economic Journal. Vol.95, March 1985, pp.30-48.
- [4] Alston, Lee J., Samar Datta, and Jeffery Nugent. "Tenancy Choice in a Competitive Framework with Transaction Costs." Journal of Political Economy. Vol.92, December 1984, pp.1121-1133.
- [5] ARDA. Planning for Agriculture in Southern Ontario, ARDA Report No.2. Center for Resources Development, University of Guelph, Guelph, Ontario.
- [6] Arroyo, G.J.C. "Dynamic Programming Models for Identification and Measurement of Inefficiencies in Leasing Arrangement." Published Ph.D. Dissertation. Iowa State University, Ames, 1961.
- [7] Bailey, W.R. "Necessary Conditions for Growth of Farm Business Firms." Agriculture Economics Research. Vol.29, No.1, January 1967, pp.1-6.
- [8] Bardhan, P.K. and Srinivasan, T.N. "Cropsharing Tenancy in Agriculture." American Economic Review. Vol.41, 1971, pp. 48-64.
- [9] Barlowe, Raleigh. Land Resource Economics. Englewood Cliffs, N.J. Prentice-Hall, Inc., 1958.
- [10] Barzel, Yorman. "The Entrepreneur's Reward for Self-Policing." Economic Enquiry. Vol. 25, January 1987, pp.103-116.
- [11] _____. Economic Analysis of Property Rights. Cambridge, Cambridge University Press, 1989.

Bibliography Continued

- [12] _____. and Wing Suen. "Moral Hazard, Monitoring Costs, and the Choice of Contracts." Working Paper, University of Washington, Seattle, 1988.
- [13] Batra, R.N. and A. Ullah. "Competitive Firm and Theory of Input Demand Under Price Uncertainty." Journal of Political Economy. Vol.82, No.3, May 1974, pp. 537-558.
- [14] Berry, Russel L. "Share Rents as an Obstacle to Farm Improvement and Soil Conservation." Land-Economics. Vol.40, No.3, August 1964, pp. 346-352.
- [15] Berry, Russel L. and Bau, Vernon E. Tenant Interest in Long-Term Cash and Flexible Cash Leases. Research Bulletin 480, South Dakota Agricultural Experiment Station.
- [16] Boxley, Robert F. "Cost-Share Leases Revisited Again." American Journal of Agricultural Economics. Vol. 53, No.3, August, 1971, pp. 529-532.
- [17] Brady, N.C. The Nature and Properties of Soils. Macmillan Publishing Co., 8th edition, 1974.
- [18] Brinkman, G.L. and Menzie, E.L. "Canada's Agri-Food Strategy: An Appraisal." Canadian Journal of Agricultural Economics. Vol.30, No.2, July 1982, pp.95-106.
- [19] Brown, D.J., and J.H. Atkinson. "Cash and Share Renting: An Empirical Test of the Link Between Entrepreneurial Ability and Contractual Choice." Bell Journal of Economics. Vol.12, 1981, pp.296-299.
- [20] Cantillon, Richard. Essai Sur La Nature Du Commerce en General. Edited by Henry Higgs. Augustus M. Kelly Bookseller, Ney York, 1964.
- [21] Castle, E. "Some Aspects of the Crop-Share Lease." Land Economics. Vol.28, No.2, May 1952, pp.177-179.

Bibliography Continued

[22] Cheung, Steven N.S. The Theory of Share Tenancy. Chicago, University of Chicago Press, 1969.

[23] Chryst, Walter E. and Timmons, John F. Adjusting Farm Rents to Changes in Prices, Costs and Production. Special Report No.9, Iowa Agricultural Experiment Station, 1955.

[24] Chryst, Walter E. "Relative Efficiencies of Alternative Tenure Systems." Journal of Farm Economics. Vol.37, No.5, December 1955, pp.1333-1340.

[25] Ciriacy-Wantrup, S.V. Resource Conservation, Economics and Policies. University of California, Division of Agriculture Sciences, 1968.

[26] Currie, J.M. The Economic Theory of Agricultural Land Tenure. Cambridge University Press, 1981

[27] Crosson, P. and Miranowski, J. "Soil Protection: Why, by Whom and for Whom?" Journal of Soil and Water Conservation. Vol.37, No.1, January 1982, pp.27-29.

[28] Day, Richard H. "The Economies of Technological Change and the Demise of the Sharecropper." American Economic Review. Vol.51, June 1967, pp.427-449.

[29] De Benedictis, Michele and Timmons, John F. Linear Programming in Investigating Intratemporal Inefficiencies in Leasing Systems. Research Bulletin 490, Iowa Agricultural Research Station, 1961.

[30] Dorner, Peter. "Land Tenure, Income Distribution and Productivity Interactions." Land Economics. Vol.40, No.3, August 1964, pp.247-254.

[31] Driver, Herbert Coleman. Tenure Forms and Instruments Impeding or Facilitating Farm Entry and Optimal Resource Efficiency. Iowa State University, 1969.

Bibliography Continued

[32] Easterbrook, W.T. Canadian Economic History. Macmillan Co., Toronto, 1956.

[33] Eswaran, Mukesh, and Ashok Kotwal. "A Theory of Contractual Structure in Agriculture." American Economic Review. Vol.75, June 1985, pp.352-367.

[34] Evans, David S., and Boyan Jovanovic, "An Estimated Model of Entrepreneurial Choice Under Liquidity Constraints." Journal of Political Economy. Vol. 97, August 1989, pp.808-827.

[35] Gilson, J.C. Economic Aspects of Tenant Operated Farms. Department of Agricultural Economic Research. Report No.5, University of Manitoba, 1960.

[36] Gray, E.C. Land Tenure, Land Use and Rural Development. School of Agricultural Economics and Extension Education. University of Guelph, November 1977.

[37] Grossman, Sanford, and Oliver Hart. "The costs and Benefits of Ownership: A Theory of Vertical and Horizontal Integration." Journal of Political Economy. No.94, 1986, pp.691-719.

[38] Hallagan, William. "Self-Selection by Contractual Choice and the Theory of Share-Cropping." Bell Journal of Economics. No.9, 1978 pp.344-354.

[39] Heady, Earl O. "Economics of Farm Leasing Systems." Journal of Farm Economics. Vol.29, No.3, August 1947, pp.659-678.

[40] Heady, Earl O. Marginal Productivity of Resources and Imputation of Shares for Cash and Share Rented Farms. Research Bulletin 386, Iowa Agricultural Experiment Station, 1955.

[41] Heady, Earl O. and Kehrberg, Earl W. Relationships of Crop-Share and Cash Leasing Systems to Farming Efficiency. Research Bulletin 386, Iowa Agricultural Experiment Station, 1952.

Bibliography Continued

[42] Heady, Earl O., Dean, Gerald W. and Egbert, Alvin C. Analysis of the Efficiencies of Alternative Farm Leasing Arrangements. Research Bulletin 445, Iowa Agricultural Research Station, 1956.

[43] Hull, Henry, C. The Economic Writings of Sir William Petty. Augustus M. Kelly Bookseller, New York, 1963.

[44] Hurlburt, Virgil. Farm Rental Practices and Problems in the Midwest. Research Bulletin 215, Nebraska Agricultural Experiment Station Bulletin, 1964.

[45] Hurlburt, Virgil. Use of Farm Resources as Conditioned by Tenure Arrangements. Research Bulletin 215, Nebraska Agricultural Experiment Station Bulletin, 1964.

[46] Ip, P.C. and Stahl, C.W. "Systems of Land Tenure, Allocative Efficiency and Economic Development." American Journal of Agricultural Economics. Vol.60, No.1, February 1978, pp.19-28.

[47] Issawi, C. "Farm Output Under Fixed Rents and Share Tenancy." Land Economics. Vol.33, No.1, February 1957, pp.74-77.

[48] Johnson, B.B. "Farmland Leasing as a Means of Resource Control in U.S. Land-Based Agriculture." Ph.D Dissertation. Michigan State University, East Lansing, 1973.

[49] Johnson, Bruce, Larry Janssen, Micheal Lundeen, and J.David Aiken. Agricultural land Leasing and Rental Market Characteristics: A Case Study of South Dakota and Nebraska. Report Prepared for the Economic Research Service of the United States Department of Agriculture, Washington D.C. 1988.

[50] Johnson, Gale D. "Resource Allocation Under Share Contracts." Journal of Political Economy. Vol.58, No.2, April 1950, pp.111-123.

[51] Just, Richard E, and Rulon D. Pope. "Stochastic Specification of Production Functions and Economic Implications." Journal of Econometrics. No.7, January 1978, pp.67-86.

Bibliography Continued

- [52] Kanuk, I. "Mail Surveys and Response Rates." Journal of Marketing Research. Vol.12, November 1975, pp.440-453
- [53] Keiper, J.S., Kurnow, E., Clark, C.D. and Segal, H.H. Theory and Measurement of Rent. New York: Chilton Co. 1961.
- [54] Krausz, N.G.P. and Reiss, F.J. "Institutions and Instruments Management Alternatives." American Journal of Agricultural Economics. Vol. 51, No.5, December 1969, pp.1369-1380.
- [55] Laflen, J.M. Conservation tillage and soil erosion on continuously rowcropped land. American Sociological Agricultural Engineering, 1978.
- [56] Lee, John E. "Changes in the Financial Structure of the Farm Sector and the Implications for Research." Journal of Farm Economics. Vol.50, No.5, December 1968, pp.1552-1563.
- [57] Lee, L.K. "The Impact of Landownership Factors on Soil Conservation." American Journal of Agricultural Economics. Vol.62, No.5, pp1070-1083.
- [58] Lev, Benjamin. and Campbell, Arthur. "Resource Planning Techniques", 1986.
- [59] Lewis, J.A. "Landownership in the United States." Agricultural Information Bulletin. No.435, 1978.
- [60] Loftsgard, Laurel D. and Heady, Earl W. "Application of Dynamic Programming Models for Optimum Farm and Home Plans." Journal of Farm Economics. Vol.41, No.1, February 1959, pp.51-62.
- [61] Lucas, Robert E.B. "Sharing, Monitoring, and Incentives: Marshallian Misallocation Reassessed." Journal of Political Economy, No.87, pp.501-521.
- [62] Marshall, Alfred. Principles of Economics. London, England: Macmillan and Co. 8th edition, 1930.

Bibliography Continued

[63] McCulloch, J.R. The Principles of Political Economy. New York: Augustus M. Kelly Bookseller, 5th edition, 1965.

[64] Mill, John Stuart. Principles of Political Economy. University of Toronto Press, 1965, Chapter 8.

[65] Monroe, Arthur Eli. Early Economic Thought. Cambridge Harvard University Press, 1951.

[66] Newberry, David, and Joseph Stiglitz. "Sharecropping, Risk Sharing, and the Importance of Imperfect Information" Berkeley University of California Press, 1979.

[67] Otsuka, Keijiro, and Yujiro Hayami. "Theories of Share Tenancy: A Crucial Survey." Economic Development and Cultural Change, 1988, pp.31-68.

[68] Ottoson, H.W. "The Application of Efficiency to Farm Tenure Arrangements." Journal of Farm Economics. Vol.37, No.5, 1955, pp.1341-1353.

[69] Packman, D.J. "The Landlord-Tenant Situation on Two-Hundred Farms in Southern Ontario." Economic Annalist. No.25, 1955, pp.20-23.

[70] Prystupa, Katrina. "Manitoba Agriculture and the Law." Manitoba Agriculture, 1986.

[71] Reiss, F.G. Farm Lease Practice in Western Illinois. Research Bulletin 728. Illinois Agricultural Experiment Station Bulletin, 1968.

[72] Reid, J.D. "Sharecropping in History and Theory." Agriculture History. No.49, 1975, pp.426-440.

[73] Ricardo, David. The Principles of Political Economy and Taxation. London. 1817, Everyman's Edition, J.M. Dent and Sons Ltd., London 1911.

[74] S.A.S. Statistical Analysis System, S.A.S Institute Incorporated, 1985.

[75] Schickele, Reiner. "Effects of Tenure Systems on Agricultural Efficiency." Journal of Farm Economics. Vol.23, No.1, 1941, pp.185-207.

[76] Schultz, T.W. "Capital Rationing, Uncertainty, and Farm Tenancy Reform." Journal of Political Economy. Vol.48, No.3, 1940, pp.309-324.

[77] Smith, Adam. The Wealth of Nations. (Vol.1-3), Edinburgh: 1819.

[78] Spillman, W.J. "The Agricultural Ladder." American Economic Review Supplement. March 1919, pp.170-179.

[79] Timmons, John F. "Improving Farm Rental Arrangements in Iowa." Research Bulletin 393. Iowa Agricultural Research Station, 1953.

[80] Timmons, John F. "Agricultural Land Leases and Implications." Research Bulletin 731. Iowa Agricultural Research Station, 1958.

[81] Timmons, John F. and Cormack, J.M. Role of Land Tenure in Use of Land Resources. 1957.

[82] Toussaint, W.D. "Two Empirical Techniques Applicable to Land Tenure Research." Journal of Farm Economics. Vol.37, No.1, 1955, pp.1354-1363.

[83] United States Department of Agriculture. Agricultural Statistics 1986. Washington D.C. U.S Government Printing Office, 1987.

[84] Withers, R.V. and Grant, D.L. Land Tenure And Leasing in Idaho Agriculture. Research Bulletin 579. Idaho Agricultural Research Station, 1978.

Sample#

Section I. General Information

1. Are you a full-time farmer?
 No ... 0 Yes ... 1

2. What proportion of your total earnings is derived from farming?
 None ... 0
 1/4. 1
 1/2. 2
 3/4. 3
 All. 4

If all, proceed to question 4.

3. Do you have any off-farm employment and if so, what is your occupation?
 Unskilled labourer 1
 Skilled labourer. 2
 Service industry. 3
 Businessman 4
 Civil servant. 5
 Professional 6
 Other (please specify). 7

4. How many acres did you farm in 1989?

5. How many acres of land do you own?
 If none, proceed to question 6.

i) Of that area how many acres were cropped by you in 1989?

ii) How many acres did you rent out?

6. How many acres of the land you farmed in 1989 was rented? Please include land worked by you on a share basis or under any lease arrangement. If none, proceed to question 7.

i) Of that area, how many acres were cropped in 1989?

7. If you do not rent is there any likelihood that in the near future you will?
 No ... 0 Yes ... 1 Don't know ... 2

8. Can you please tell me approximately what percentage of your gross farm income came from:

Dairy	<input type="text"/>	%	Cash Crops	<input type="text"/>	%
Beef	<input type="text"/>	%	Other:	<input type="text"/>	%
Swine	<input type="text"/>	%		<input type="text"/>	%
Poultry	<input type="text"/>	%		<input type="text"/>	%
Sheep	<input type="text"/>	%		<input type="text"/>	%

9. What percentage of your cash crops in 1989 were:

Wheat	<input type="text"/>	%	Flax	<input type="text"/>	%
Barley	<input type="text"/>	%	Sugarbeets	<input type="text"/>	%
Oats	<input type="text"/>	%	Potatoes	<input type="text"/>	%
Canola	<input type="text"/>	%	Other:	<input type="text"/>	%

Section II. Farm Practices on Owned Land

NOTE: If you do not own land, proceed to Section III

1. Do you fertilize/manure on owned land?
 If no, proceed to question 3.

No ... 0 Yes ... 1

i) If yes, which form or combination do you use?

Chemical ... 0
 Manure 1
 Both. 2

2. Between the harvest of 1988 and the end of the planting time of 1989, how many acres were fertilized/manured on owned land?

3. On your owned land, do you:

No ... 0 Yes ... 1

Rotate crops	<input type="text"/>
Use weed control	<input type="text"/>
Plant windbreaks	<input type="text"/>
Control erosion *	<input type="text"/>
Pick stones	<input type="text"/>
Irrigate	<input type="text"/>

* Strip crop, contour plow, spring plow, minimum till

Section III. Farm Practices on Rented Land

NOTE: If you do not rent land proceed to Section IV.

1. Do you fertilize/manure on rented land?
If no, proceed to question 3.

No ... 0 Yes ... 1

i) If yes, which form or combination do you use?

Chemical ... 0
Manure ... 1
Both ... 2

2. Between the harvest of 1988 and the end of planting time of 1989, how many acres were fertilized/manured on rented land?

3. Do your landlords make decisions on how to operate their land?

No ... 0 Yes ... 1

4. On your rented land, do you:

No ... 0 Yes ... 1

Rotate crops
Control erosion*
Pick stones
Plant windbreaks
Use weed control
Irrigate

* Strip crop, contour plow, spring plow, minimum till

5. On the land you rent, does any part of it need:

Erosion control ...
Draining ...
Clearing ...
Other (please specify)

6. If you continued to rent, during the next five years, would you expect expenditures by yourself and/or landlords on:

If no, why?

Reasons:
Erosion control ...
Draining ...
Clearing ...
Windbreaks ...
Irrigation ...
Other (please specify)

7. If you were to purchase the land you presently rent, how would you change practices on it? Some examples are given. Please check appropriate boxes.

No changes ...
Rotate crops more frequently. ...
Apply more manure ...
More commercial fertilizer ...
More weed control. ...
More erosion control ...
Grow different crops ...
Plant windbreaks ...
Install irrigation systems. ...
Other (please specify)

Section IV. Farm Practices on Owned and Rented Land - Please see Chart 1, page 5.

Section V. Farm Size Expansion

1. Over the past five years, or since you started farming, has the area of cropland you have farmed:

Decreased ... 1
Remained the same. 2
Increased. ... 3

If this area increased then:

How did this occur and by how many acres:

Land purchased (in acres) ...
Land rented (in acres). ...
Inherited land (in acres) ...

Has the increase been in:

Cropland (in acres) ...
Pasture (in acres). ...

Section V1. Lease Preference

NOTE: Only answer this section if you rent land.

1. When a lease is drawn up, which points do you consider to be important to you:
 Not important . . . 0 Important . . . 1

Lease should be written	<input type="checkbox"/>
Lease should be verbal	<input type="checkbox"/>
Periodic review of lease.	<input type="checkbox"/>
Compensation for land improvements made by tenant.	<input type="checkbox"/>
Adequate notice of renewal or cancellation	<input type="checkbox"/>
Provisions regarding rental rate adjustments	<input type="checkbox"/>
Option to buy	<input type="checkbox"/>
Other (please specify)	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>

2. What form of rental payment do you prefer?
 Not preferred . . . 0 Preferred . . . 1

Fixed cash	<input type="checkbox"/>
Flexible cash *	<input type="checkbox"/>
Fixed share rent.	<input type="checkbox"/>
Flexible share rent.	<input type="checkbox"/>
Other (please specify)	<input type="checkbox"/>
_____	<input type="checkbox"/>
_____	<input type="checkbox"/>

* depending on yields and prices

3. For what length of time do you prefer a lease?

One year	1
Two years	2
Three years	3
Four years	4
Five or more years.	5

4. In 1989 could your please tell me how many acres were used to grow the following on your i) rented and ii) owned land (if applicable).

	Owned	Rented
Pure Alfalfa	_____	_____
Pure Clover.	_____	_____
Alfalfa mixture	_____	_____
Tame Hay.	_____	_____
Permanent Pasture	_____	_____
Soybeans	_____	_____
Winter Wheat	_____	_____
Spring Wheat	_____	_____
Oats	_____	_____
Barley.	_____	_____
Mixed (Oats and Barley)	_____	_____
Canola	_____	_____
Flax	_____	_____
Corn Silage	_____	_____
Corn Grain	_____	_____
Potatoes	_____	_____
Sugar beets	_____	_____
Sunflowers	_____	_____
Mustard seed	_____	_____
Other (please specify)	_____	_____
_____	_____	_____
_____	_____	_____

5. For those crops you grew on both owned and rented land in 1989, were the crop yields on owned land higher or lower than those on rented land? Please specify crop, and check the appropriate yield ranges as indicated below:

Crop 1: _____
 Crop 2: _____
 Crop 3: _____
 Crop 4: _____

Difference of yields from owned versus yields from rented land.

	Crop			
	1	2	3	4
> 30%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16% to 30%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6% to 15%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0% to 5%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
< 0% to 5%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6% to 15%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16% to 30%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
over 30%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
do not know	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section VII. Personal History

1. Sex:
Female . . . 0
Male 1

2. What is your age group?
Under 25. . 1 50-54. . . . 7
25-29. . . . 2 55-59. . . . 8
30-34. . . . 3 60-64. . . . 9
35-39. . . . 4 65-69. . . .10
40-44. . . . 5 Over 70 . .11
45-49. . . . 6

3. How many years have you farmed?

4. Marital Status:
Married 1
Single. 2
Divorced/Separated 3
Cohabiting. 4
Widowed. 5

i. How many years of education have you successfully completed?

. At what level did you stop going to school?
Primary 1
Secondary. . . . 2
Vocational. . . . 3
University 4
Other. 5

Are you a member of any church?
No . . . 0 Yes . . . 1

If yes, which denomination:

- Roman Catholic 1
- United Church of Canada 2
- Anglican 3
- Lutheran 4
- Presbyterian 5
- Greek Orthodox 6
- Jewish 7
- Ukranian Catholic 8
- Pentecostal 9
- Mennonite 11
- Jehovah's Witnessess.12
- Other (please specify) 13

Chart 1

Rented Parcels

Landlord	Number of years occupied or rented	Length of lease Agreements (In years)	Type of lease	Form of rental payment	Cash rent per acre	Estimated value of land per acre	Size (acres)	Residence of landlord	Distance from farmers residence	Occupation of landlord	Relationship to landlord	# of years of continuous cropping	Soil samples taken (last 2 years)	Crops grown in 1989	Summer-fallow (acres)	Pasture (acres)
Owned																
1																
2																
3																
4																
5																
6																
7																
8																

Type of lease: Verbal... 1, Written ... 2.

Form of rental payment: Cash... C, Share-crop... S, Both Part-cash, Part-share... PCS.

Residence of landlord: On rented land... 1, Elsewhere within the municipality ... 2, Elsewhere in Manitoba... 3, Elsewhere in Canada... 4, Other... 5.

Average distance from farmers residence: 0.0 - 0.9... 1, 1.0 - 2.9... 2, 3.0 - 5.0... 3, Over 5 miles... 5.

Occupation of landlord: Farmer... 1, Retired farmer... 2, Non farmer...3, Other...4.

Relationship to landlord: Relative... 1, Non relative... 2.

of years of continuous cropping: One year... 1, Two years... 2, Three years... 3, Four years... 4, Five or more years... 5.

Soil samples taken (last two years): None... 0, Once... 1, Twice... 2, Three times... 3, Four times... 4, Five or more times... 5.

Crops grown in 1989: Pure alfalfa... 1, Pure clover... 2, Alfalfa mixture... 3, Tame hay... 4, Spring wheat... 5, Winter wheat... 6, Barley... 7, Oats... 8, Mixed oats and barley... 9, Corn silage... 10, Corn grain... 11, Soybeans... 12, Potatoes...13, Other (specify)... 14. *sugarbeets... 15*

```

1. 1 //LUSSIER% JOB 'J063040,XXXX,T=120,I=17,I=50','SAS2',NOTIFY=LUSSIER
2. // USER=LUSSIER,PASSWORD=
3. ***JOBPARM XLOE,PPUS,BELL
4. ***TSO
5.
6. 2 // EXEC SASV5
38 //SYSIN DD *
TSS7011 LUSSIER LAST-USED 23 OCT 91 10:27 SYSTEM=MVS3 FACILITY=TSO
IEF1421 LUSSIER% GD - STEP WAS EXECUTED - COND CODE 0000
IEF3731 STEP /GO / START 91296.1046
IEF3741 STEP /GO / STOP 91296.1046 CPU 0 MIN 02.60SEC SRB 0 EXCP (3420)
C EXCP (3350) 761 EXCP (3380) 0 EXCP (3420) 0 EXCP (3480)
IEF3751 JOB /LUSSIER% START 91296.1046
IEF3761 JOB /LUSSIER% STOP 91296.1046 CPU 0 MIN 02.60SEC SRB 0 EXCP (3480)
OMIN 00.28SEC VIRT 4096K SYS 320
OMIN 00.28SEC

```

```

1 PROC FORMAT;
2 VALUE VFULLTIM 0='NO'
NOTE: FORMAT VFULLTIM HAS BEEN OUTPUT.
3
4 VALUE VEARNING 0='NONE'
5 1='1/4'
6 2='1/2'
7 3='3/4'
NOTE: FORMAT VEARNING HAS BEEN OUTPUT.
8
9 VALUE V OCCUP 1='UNSKILLED LABOURER'
10 2='SKILLED LABOURER'
11 3='SERVICE INDUSTRY'
12 4='BUSINESSMAN'
13 5='CIVAL SERVANT'
14 6='PROFESSIONAL'
NOTE: FORMAT V OCCUP HAS BEEN OUTPUT.
15
16 VALUE VLIKELYR 0='NO'
NOTE: FORMAT VLIKELYR HAS BEEN OUTPUT.
17
18 VALUE VOFERT 0='NO'
NOTE: FORMAT VOFERT HAS BEEN OUTPUT.
19
20 VALUE VOFERTE 0='CHEMICAL'
21 1='MANURE'
NOTE: FORMAT VOFERTE HAS BEEN OUTPUT.
22 2='BOTH';
23
24 VALUE VPFERT 0='NO'
NOTE: FORMAT VPFERT HAS BEEN OUTPUT.
25
26 VALUE VRFERTE 0='CHEMICAL'
27 1='MANURE'
NOTE: FORMAT VRFERTE HAS BEEN OUTPUT.
28 2='BOTH';
29
30 VALUE VDECISID 0='NO'
NOTE: FORMAT VDECISID HAS BEEN OUTPUT.
31
32 VALUE VCLAREA 1='DECREASED'
2='REMAINED THE SAME'
33 3='INCREASED';

```

109

2
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

SAS(R) LOG DS SAS 5.16

MVS/XA JOB LUSSIER\$ STEP 60

10:46

VALUE VLEASEL 1='ONE YEAR'
 2='TWO YEARS'
 3='THREE YEARS'
 4='FOUR YEARS'
 5='FIVE OR MORE YEARS';
 VALUE VSEX 0='FEMALE'
 1='MALE';
 VALUE VAGE 1='less than 45'
 2='45 and over';

NOTE: FORMAT VLEASEL HAS BEEN OUTPUT.

NOTE: FORMAT VSEX HAS BEEN OUTPUT.

NOTE: FORMAT VAGE HAS BEEN OUTPUT.

VALUE VMSTATUS 1='MARRIED'
 2='SINGLE'
 3='DIVORCED/SEPARATED'
 4='COHABITING'
 5='WIDOWED';

NOTE: FORMAT VMSTATUS HAS BEEN OUTPUT.

VALUE VEDUCL 1='PRIMARY'
 2='SECONDARY'
 3='VOCATIONAL'
 4='UNIVERSITY'
 5='OTHER';

NOTE: FORMAT VEDUCL HAS BEEN OUTPUT.

VALUE VCHURCHM 0='NO'
 1='YES';

NOTE: FORMAT VCHURCHM HAS BEEN OUTPUT.

VALUE VDENOM 1='ROMAN CATHOLIC'
 2='UNITED CHURCH'
 3='ANGLICAN'
 4='LUTHERAN'
 5='PRESBYTERIAN'
 6='GREEK ORTHODOX'
 7='JEWISH'
 8='UKRAINIAN CATHOLIC'
 9='PENITENTIAL'
 11='METHODIST'
 12='JEHOVAH WITNESS'
 13='OTHER';

NOTE: FORMAT VDENOM HAS BEEN OUTPUT.

VALUE VLEASE 1='VERBAL'
 2='WRITTEN';

NOTE: FORMAT VLEASE HAS BEEN OUTPUT.

VALUE VPYMT 1='CASH'
 2='SHARE-CRDP'
 3='PART-SHARE';

NOTE: FORMAT VPYMT HAS BEEN OUTPUT.

VALUE VRES 1='ON RENTED LAND'
 2='MUNICIPALITY'

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.

3 SAS(R) LOG DS SAS 5.16

MVS/XA JOB LISSIER\$ STEP 00

82 3='MANITIBA'
 83 4='CANADA'
 NOTE: FORMAT VRES HAS BEEN OUTPUT.
 84 5='OTHER':
 85 1='0.0-0.9'
 86 2='1.0-2.9'
 87 3='3.0-5.0'
 NOTE: FORMAT VDIST HAS BEEN OUTPUT.
 88 5='OVER 5 MILES':
 89 1='FARMER'
 90 2='RETIRED FARMER'
 91 3='NON-RETIRED'
 NOTE: FORMAT VCCU HAS BEEN OUTPUT.
 92 4='OTHER':
 93 1='RELATIVE'
 94 2='NON-RELATIVE':
 95 0='NONE'
 96 1='ONCE'
 97 2='TWICE'
 NOTE: FORMAT VSAMPLE HAS BEEN OUTPUT.
 98 3='THREE TIMES':
 99 1='PURE ALFALFA'
 100 2='PURE CLOVER'
 101 3='ALFALFA MIX'
 102 4='TAME HAY'
 103 5='SPRING WHEAT'
 104 6='WINTER WHEAT'
 105 7='BARLEY'
 106 8='OATS'
 107 9='OATS & BARLEY'
 108 10='CORN SILAGE'
 109 11='CORN GRAIN'
 110 12='SOYBEANS'
 111 13='POTATIES'
 112 14='PEAS'
 113 15='SUGARBEETS'
 114 16='LENTALS'
 115 17='BEANS'
 116 18='SUNFLOWERS'
 117 19='OTHER'
 118 20='FLAX'
 119 21='CANOLA'
 NOTE: FORMAT VCROP HAS BEEN OUTPUT.
 120 22='CANARY SEED':
 121
 122
 NOTE: THE PROCEDURE FORMAT USED 0.76 SECONDS AND 92276K.
 123 DATA:
 124 INPUT
 125 NUMBER 3.
 126 FULLTIME 1.
 127 EARNINGS 1.
 128 OCCUP 1.
 129 TOTAL_A 4.
 130 OWNED_A 4.
 131 CROP_H A 4.

82.
 83.
 84.
 85.
 86.
 87.
 88.
 89.
 90.
 91.
 92.
 93.
 94.
 95.
 96.
 97.
 98.
 99.
 100.
 101.
 102.
 103.
 104.
 105.
 106.
 107.
 108.
 109.
 110.
 111.
 112.
 113.
 114.
 115.
 116.
 117.
 118.
 119.
 120.
 121.
 122.
 123.
 124.
 125.
 126.
 127.
 128.
 129.
 130.
 131.

111

4

SAS(R) LOG OS SAS 5.16

MVS/XA JOB LUSSIER\$ STEP GO

10:46

132 RENT_OUT 4.
 133 RENTED_A 4.
 134 CROP_R 4.
 135 LIKELY_R 1.
 136
 137 IDAURY 3.
 138 IRFF 3.
 139 ISWINE 3.
 140 IPDULTRY 3.
 141 ISHEEP 3.
 142 ICC 3.
 143 IUTHER 3.
 144
 145 CCWHEAT 3.
 146 CCRAPLEY 3.
 147 CCDAIS 3.
 148 CCGANDLA 3./
 149 CCFLAX 3.
 150 CCSUGAR 3.
 151 CCPOTATO 3.
 152 CCSUNFLD 3.
 153 CCPEAS 3.
 154 CCCORN 3.
 155 CCLENTAL 3.
 156 CCREAMS 3.
 157 CCOOTHER 3.
 158
 159 O_FEPT 1.
 160 O_FERTIF 1.
 161 O_FERT_A 4.
 162
 163 O_RC 1.
 164 O_CE 1.
 165 O_PS 1.
 166 O_PW 1.
 167 O_I 1.
 168 O_OTHER 1.
 169
 170 R_FEPT 1.
 171 R_FERTIF 1.
 172 R_FERT_A 4.
 173 DECISION 1.
 174
 175 R_RC 1.
 176 R_CE 1.
 177 R_PS 1.
 178 R_PW 1.
 179 R_I 1.
 180 R_OTHER 1.
 181
 182 RN_CCF 1.
 183 RN_DRAIN 1.
 184 RN_CLEAR 1.
 185 RN_OTHER 1.
 186
 187 RE_CCF 1.
 188 RE_DRAIN 1.
 189 RE_CLEAR 1.

132.
 133.
 134.
 135.
 136.
 137.
 138.
 139.
 140.
 141.
 142.
 143.
 144.
 145.
 146.
 147.
 148.
 149.
 150.
 151.
 152.
 153.
 154.
 155.
 156.
 157.
 158.
 159.
 160.
 161.
 162.
 163.
 164.
 165.
 166.
 167.
 168.
 169.
 170.
 171.
 172.
 173.
 174.
 175.
 176.
 177.
 178.
 179.
 180.
 181.
 182.
 183.
 184.
 185.
 186.
 187.
 188.
 189.

6

SAS(R) LUG HS SAS 5.16

MVS/XA JOB LUSSIER% STEP 60

248 OLENTAL 4.1
 249 OBEANS 4.
 250 OOTHER 4.
 251
 252 RPA 4.
 253 RPC 4.
 254 RAM 4.
 255 RTH 4.
 256 RPP 4.
 257 RSNYA 4.
 258 RWW 4.
 259 RSW 4.
 260 ROATS 4.
 261 RR 4.
 262 RM 4.
 263 RC 4.
 264 RF 4.
 265 RGS 4.1
 266 RCG 4.
 267 RP 4.
 268 RSB 4.
 269 RSE 4.
 270 RMS 4.
 271 RPFAS 4.
 272 RLENTAL 4.
 273 RBEANS 4.
 274 ROTHER 4.
 275
 276 SEX 1.
 277 AGE 2.
 278 FYEARS 2.
 279 M_STATUS 1.
 280 EDUCYEAR 2.
 281 EDUCLEV 1.
 282 CHURCH M 1.
 283 DENUM 2.1
 284
 285 VOA 2.
 286 VOB 4.
 287 VOC 4.
 288 VOD 2.
 289 VOE 1.
 290 VOEA 2.
 291 VOEB 2.
 292 VOG 3.
 293 VOH 3.
 294
 295 VIA 2.
 296 VIB 1.
 297 VIC 1.
 298 VID 1.
 299 VIF 2.
 300 VIF 4.
 301 VIG 4.
 302 VIH 1.
 303 VIT 1.
 304 VIJ 1.
 305 VIK 1.

248.
 249.
 250.
 251.
 252.
 253.
 254.
 255.
 256.
 257.
 258.
 259.
 260.
 261.
 262.
 263.
 264.
 265.
 266.
 267.
 268.
 269.
 270.
 271.
 272.
 273.
 274.
 275.
 276.
 277.
 278.
 279.
 280.
 281.
 282.
 283.
 284.
 285.
 286.
 287.
 288.
 289.
 290.
 291.
 292.
 293.
 294.
 295.
 296.
 297.
 298.
 299.
 300.
 301.
 302.
 303.
 304.
 305.

306 V1L 2.
 307 V1M 1.
 308 V1NA 2.
 309 V1NR 2.
 310 V1N 3.
 311 V1P 3.7
 312
 313 V2A 2.
 314 V2B 1.
 315 V2C 1.
 316 V2D 1.
 317 V2E 2.
 318 V2F 4.
 319 V2G 4.
 320 V2H 1.
 321 V2I 1.
 322 V2J 1.
 323 V2K 1.
 324 V2L 2.
 325 V2M 1.
 326 V2NA 2.
 327 V2NR 2.
 328 V2N 3.
 329 V2P 3.
 330
 331 V3A 2.
 332 V3B 1.
 333 V3C 1.
 334 V3D 1.
 335 V3E 2.
 336 V3F 4.
 337 V3G 4.
 338 V3H 1.
 339 V3I 1.
 340 V3J 1.
 341 V3K 1.
 342 V3L 2.
 343 V3M 1.
 344 V3NA 2.
 345 V3NR 2.
 346 V3N 3.
 347 V3P 3.7
 348
 349 V4A 2.
 350 V4B 1.
 351 V4C 1.
 352 V4D 1.
 353 V4E 2.
 354 V4F 4.
 355 V4G 4.
 356 V4H 1.
 357 V4I 1.
 358 V4J 1.
 359 V4K 1.
 360 V4L 2.
 361 V4M 1.
 362 V4NA 2.
 363 V4NR 2.

306.
 307.
 308.
 309.
 310.
 311.
 312.
 313.
 314.
 315.
 316.
 317.
 318.
 319.
 320.
 321.
 322.
 323.
 324.
 325.
 326.
 327.
 328.
 329.
 330.
 331.
 332.
 333.
 334.
 335.
 336.
 337.
 338.
 339.
 340.
 341.
 342.
 343.
 344.
 345.
 346.
 347.
 348.
 349.
 350.
 351.
 352.
 353.
 354.
 355.
 356.
 357.
 358.
 359.
 360.
 361.
 362.
 363.

R

SAS(P) LOG NS SAS 5.16

MVS/XA JOB LUSSIER\$ STEP GO

364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421

V4D 3.
V4P 3.

V5A 2.
V5B 1.
V5C 1.
V5D 1.
V5E 2.
V5F 4.
V5G 4.
V5H 1.
V5I 1.
V5J 1.
V5K 1.
V5L 2.
V5M 1.
V5NA 2.
V5NB 2.
V5N 3.
V5P 3.:

FORMAT
FULLTIME VFULLTIM.
EARNINGS VFARNING.
OCCUP V OCCUP.
LIKELY R V LIKELYR.
O_FERT VOFFERT.
O_FERT_A VOFFERTF.
P_FERT VREFERT.
R_FERT_F VREFERTF.
DECISION VDECISION.
CL_AREA VCLAREA.
LEASE_L VLEASEL.
SEX VSEX.
AGE VAGE.
M_STATUS VMSTATUS.
EDUC LEV VEDUCL.
CHURCH M VCHURCHM.
DENOM VDENOM.

V1C VLEASE.
V2C VLEASE.
V3C VLEASE.
V4C VLEASE.
V5C VLEASE.
V1D VPYMT.
V2D VPYMT.
V3D VPYMT.
V4D VPYMT.
V5D VPYMT.
V1H VRES.
V2H VRES.
V3H VRES.
V4H VRES.
V5H VRES.
V1I VDIST.
V2I VDIST.
V3I VDIST.

364.
365.
366.
367.
368.
369.
370.
371.
372.
373.
374.
375.
376.
377.
378.
379.
380.
381.
382.
383.
384.
385.
386.
387.
388.
389.
390.
391.
392.
393.
394.
395.
396.
397.
398.
399.
400.
401.
402.
403.
404.
405.
406.
407.
408.
409.
410.
411.
412.
413.
414.
415.
416.
417.
418.
419.
420.
421.

422	V4T	VDIST.	422.
423	V5T	VDIST.	423.
424	V1J	VOCPU.	424.
425	V2J	VOCPU.	425.
426	V3J	VOCPU.	426.
427	V4J	VOCPU.	427.
428	V5J	VOCPU.	428.
429	V1K	VREL.	429.
430	V2K	VREL.	430.
431	V3K	VREL.	431.
432	V4K	VREL.	432.
433	V5K	VREL.	433.
434	V0F	VSAMPLE.	434.
435	V1M	VSAMPLE.	435.
436	V2M	VSAMPLE.	436.
437	V3M	VSAMPLE.	437.
438	V4M	VSAMPLE.	438.
439	V5M	VSAMPLE.	439.
440	V0FA	VCRDP.	440.
441	V0FR	VCRDP.	441.
442	V1NA	VCRDP.	442.
443	V1NR	VCRDP.	443.
444	V2NA	VCRDP.	444.
445	V2NR	VCRDP.	445.
446	V3NA	VCRDP.	446.
447	V3NB	VCRDP.	447.
448	V4NA	VCRDP.	448.
449	V4NR	VCRDP.	449.
450	V5NA	VCRDP.	450.
451	V5NB	VCRDP.	451.
452			452.
453	IF AGE<=5	THEN AGE=1:	453.
454	IF AGE>5	THEN AGE=2:	454.
455			455.
456	LABEL		456.
457	N_RC='OWNED ROTATE CROPS'		457.
458	N_CE='OWNED CONTROL FROSTON'		458.
459	N_PS='OWNED PICK STONES'		459.
460	N_PW='OWNED PLANT WINDBREAKS'		460.
461	N_TI='OWNED IRRIGATE'		461.
462	N_OTHER='OWNED OTHER'		462.
463	R_RC='RENTED ROTATE CROPS'		463.
464	R_CE='RENTED CONTROL FROSTON'		464.
465	R_PS='RENTED PICK STONES'		465.
466	R_PW='RENTED PLANT WINDBREAKS'		466.
467	R_TI='RENTED IRRIGATE'		467.
468	R_OTHER='RENTED OTHER'		468.
469	RN_CCF='NEED CONTROL FROSTON'		469.
470	RN_DRAIN='NEED DRAINAGE'		470.
471	RN_CLEAR='NEED CLEARING'		471.
472	RN_OTHER='NEED OTHER'		472.
473	RE_CCF='RENT CONTROL FROSTON EXPENDITURES'		473.
474	RE_DRAIN='RENT DRAINAGE EXPENDITURES'		474.
475	RE_CLEAR='CLEARING EXPENDITURES'		475.
476	RE_PW='PLANT WINDBREAKS EXPENDITURES'		476.
477	RE_TI='IRRIGATION EXPENDITURES'		477.
478	RE_OTHER='OTHER EXPENDITURES'		478.
479	P_NC='PURCHASE NO CHANGES'		479.

480 P_PC='PURCHASE ROTATE CROPS'
 481 P_MANURE='PURCHASE MANURE'
 482 P_CF='PURCHASE COMMERCIAL FERTILIZER'
 483 P_WC='PURCHASE WEED CONTROL'
 484 P_CE='PURCHASE CONTROL ERSION'
 485 P_DC='PURCHASE GROW DIFFERENT CROPS'
 486 P_PW='PURCHASE PLANT WINDBREAKS'
 487 P_OTHER='PURCHASE OTHER'
 488 LW='LEASE WRITTEN'
 489 LV='LEASE VERBAL'
 490 LR='LEASE REVIEW'
 491 LC='LEASE COMPENSATION'
 492 LN='LEASE NOTICE'
 493 LP='LEASE PROVISIONS'
 494 LHUY='LEASE OPTION TO BUY'
 495 LOTHER='LEASE OTHER'
 496 OPA='OWNED PURE ALFALFA'
 497 OPC='OWNED PURE CLOVER'
 498 OAM='OWNED ALFALFA MIXTURE'
 499 OTH='OWNED TAME HAY'
 500 OPP='OWNED PERMANENT PASTURE'
 501 OSOYA='OWNED SOYA'
 502 OWW='OWNED WINTER WHEAT'
 503 OSW='OWNED SPRING WHEAT'
 504 ODATS='OWNED DATS'
 505 OR='OWNED BARLEY'
 506 OM='OWNED MIXED'
 507 OC='OWNED CANOLA'
 508 OF='OWNED FLAX'
 509 OCS='OWNED CORN SILAGE'
 510 OCG='OWNED CORN GRAIN'
 511 OP='OWNED POTATOES'
 512 OSB='OWNED SUGAR BEETS'
 513 OSF='OWNED SUNFLOWERS'
 514 OMS='OWNED MUSTARD SEED'
 515 OPFAS='OWNED PEAS'
 516 OLENTAL='OWNED LENTAL'
 517 OREANS='OWNED BEANS'
 518 OOTHER='OWNED OTHER'
 519 RPA='RENTED PURE ALFALFA'
 520 RPC='RENTED PURE CLOVER'
 521 RAM='RENTED ALFALFA MIXTURE'
 522 RTH='RENTED TAME HAY'
 523 RPP='RENTED PERMANENT PASTURE'
 524 RSOYA='RENTED SOYA'
 525 RWW='RENTED WINTER WHEAT'
 526 RSW='RENTED SPRING WHEAT'
 527 RDATS='RENTED DATS'
 528 RB='RENTED BARLEY'
 529 RM='RENTED MIXED'
 530 RC='RENTED CANOLA'
 531 RF='RENTED FLAX'
 532 RCS='RENTED CORN SILAGE'
 533 RCG='RENTED CORN GRAIN'
 534 RP='RENTED POTATOES'
 535 RSB='RENTED SUGAR BEETS'
 536 RSF='RENTED SUNFLOWERS'
 537 RMS='RENTED MUSTARD SEED'

480.
 481.
 482.
 483.
 484.
 485.
 486.
 487.
 488.
 489.
 490.
 491.
 492.
 493.
 494.
 495.
 496.
 497.
 498.
 499.
 500.
 501.
 502.
 503.
 504.
 505.
 506.
 507.
 508.
 509.
 510.
 511.
 512.
 513.
 514.
 515.
 516.
 517.
 518.
 519.
 520.
 521.
 522.
 523.
 524.
 525.
 526.
 527.
 528.
 529.
 530.
 531.
 532.
 533.
 534.
 535.
 536.
 537.

```

538 RPEAS='RENTED PEAS'
539 RLENTAL='RENTED LENTAL'
540 RBFANS='RENTED BEANS'
541 ROTHER='RENTED OTHER'
542 V0A='# OF YEARS OCCUPIED'
543 V1A='# OF YEARS OCCUPIED'
544 V2A='# OF YEARS OCCUPIED'
545 V3A='# OF YEARS OCCUPIED'
546 V4A='# OF YEARS OCCUPIED'
547 V5A='# OF YEARS OCCUPIED'
548 V1B='LENGTH OF LEASE AGREEMENT'
549 V2B='LENGTH OF LEASE AGREEMENT'
550 V3B='LENGTH OF LEASE AGREEMENT'
551 V4B='LENGTH OF LEASE AGREEMENT'
552 V5B='LENGTH OF LEASE AGREEMENT'
553 V1C='TYPE OF LEASE'
554 V2C='TYPE OF LEASE'
555 V3C='TYPE OF LEASE'
556 V4C='TYPE OF LEASE'
557 V5C='TYPE OF LEASE'
558 V1D='FORM OF RENTAL PAYMENT'
559 V2D='FORM OF RENTAL PAYMENT'
560 V3D='FORM OF RENTAL PAYMENT'
561 V4D='FORM OF RENTAL PAYMENT'
562 V5D='FORM OF RENTAL PAYMENT'
563 V1E='CASH RENT'
564 V2E='CASH RENT'
565 V3E='CASH RENT'
566 V4E='CASH RENT'
567 V5E='CASH RENT'
568 V0R='EST. VALUE OF LAND'
569 V1F='EST. VALUE OF LAND'
570 V2F='EST. VALUE OF LAND'
571 V3F='EST. VALUE OF LAND'
572 V4F='EST. VALUE OF LAND'
573 V5F='EST. VALUE OF LAND'
574 V0G='SIZE (ACRES)'
575 V1G='SIZE (ACRES)'
576 V2G='SIZE (ACRES)'
577 V3G='SIZE (ACRES)'
578 V4G='SIZE (ACRES)'
579 V5G='SIZE (ACRES)'
580 V1H='LANDLORD RESIDENCE'
581 V2H='LANDLORD RESIDENCE'
582 V3H='LANDLORD RESIDENCE'
583 V4H='LANDLORD RESIDENCE'
584 V5H='LANDLORD RESIDENCE'
585 V1I='DISTANCE RESIDENCE'
586 V2I='DISTANCE RESIDENCE'
587 V3I='DISTANCE RESIDENCE'
588 V4I='DISTANCE RESIDENCE'
589 V5I='DISTANCE RESIDENCE'
590 V1J='OCCUPATION OF LANDLORD'
591 V2J='OCCUPATION OF LANDLORD'
592 V3J='OCCUPATION OF LANDLORD'
593 V4J='OCCUPATION OF LANDLORD'
594 V5J='OCCUPATION OF LANDLORD'
595 VLK='RELATIONSHIP TO LI'

```

```

538.
539.
540.
541.
542.
543.
544.
545.
546.
547.
548.
549.
550.
551.
552.
553.
554.
555.
556.
557.
558.
559.
560.
561.
562.
563.
564.
565.
566.
567.
568.
569.
570.
571.
572.
573.
574.
575.
576.
577.
578.
579.
580.
581.
582.
583.
584.
585.
586.
587.
588.
589.
590.
591.
592.
593.
594.
595.

```

```

596 V2K= 'RELATIONSHIP TO LL'
597 V3K= 'RELATIONSHIP TO LL'
598 V4K= 'RELATIONSHIP TO LL'
599 V5K= 'RELATIONSHIP TO LL'
600 V10= 'CTS CROPPING YEARS'
601 V11= 'CTS CROPPING YEARS'
602 V2L= 'CTS CROPPING YEARS'
603 V3L= 'CTS CROPPING YEARS'
604 V4L= 'CTS CROPPING YEARS'
605 V5L= 'CTS CROPPING YEARS'
606 V0F= 'SOIL SAMPLES'
607 V1M= 'SOIL SAMPLES'
608 V2M= 'SOIL SAMPLES'
609 V3M= 'SOIL SAMPLES'
610 V4M= 'SOIL SAMPLES'
611 V5M= 'SOIL SAMPLES'
612 V0FA= 'OWNED CROP GROWN (1989)'
613 V0FR= 'OWNED CROP GROWN (1989)'
614 V1NA= 'RENTED CROP GROWN (1989)'
615 V1NR= 'RENTED CROP GROWN (1989)'
616 V2NA= 'RENTED CROP GROWN (1989)'
617 V2NR= 'RENTED CROP GROWN (1989)'
618 V3NA= 'RENTED CROP GROWN (1989)'
619 V3NR= 'RENTED CROP GROWN (1989)'
620 V4NA= 'RENTED CROP GROWN (1989)'
621 V4NR= 'RENTED CROP GROWN (1989)'
622 V5NA= 'RENTED CROP GROWN (1989)'
623 V5NR= 'RENTED CROP GROWN (1989)'
624 V0G= 'SUMMERFALLOW'
625 V10= 'SUMMERFALLOW'
626 V20= 'SUMMERFALLOW'
627 V30= 'SUMMERFALLOW'
628 V40= 'SUMMERFALLOW'
629 V50= 'SUMMERFALLOW'
630 V0H= 'PASTURE'
631 V1P= 'PASTURE'
632 V2P= 'PASTURE'
633 V3P= 'PASTURE'
634 V4P= 'PASTURE'
635 V5P= 'PASTURE'
636 CARDS;

```

```

596.
597.
598.
599.
600.
601.
602.
603.
604.
605.
606.
607.
608.
609.
610.
611.
612.
613.
614.
615.
616.
617.
618.
619.
620.
621.
622.
623.
624.
625.
626.
627.
628.
629.
630.
631.
632.
633.
634.
635.
636.

```

```

NOTE: THE VARIABLE V0C IS UNINITIALIZED.
NOTE: THE VARIABLE V50 IS UNINITIALIZED.
NOTE: DATA SET WORK.DAT1 HAS 100 OBSERVATIONS AND 238 VARIABLES. 24 OBS/TRK.
NOTE: THE DATA STATEMENT USED 0.78 SECONDS AND 92220K.

```

```

1537 ;
1538 PROC FREQ;
1539 TABLES V1A V2A V3A V4A R RC V1K V2K V3K V4K V1J V2J V3J V4J
1540 R_CE V1H V2H V3H V4H V1C V2C V3C V4C V1B V2B V3B V4B;
NOTE: FOR TABLE LOCATION IN PRINT FILE, SEE

```

```

PAGE 1 FOR V1A
PAGE 1 FOR V2A
PAGE 1 FOR V3A
PAGE 2 FOR V4A
PAGE 2 FOR R_RC
PAGE 2 FOR V1K

```

```

11.
21.
21.

```