Impact of Tenancy on Land Management

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Leasing of agricultural land is gaining in importance in North America. The impact of leasing on soil management practices is examined in an area in the Canadan province of Ontario. Prevailing land contracts are insecure and the rental land market appears to be imperfect in the area. Under these conditions leasing leads to undesirable soil management practices and consequently to a lower state of conservation and to lower crop productivity over time. A difference in soil management and crop productivity has been observed between owner-operated and rented land.

Since the Second World War there has been a substantial increase in tenancy and a decrease in owner-operatorship in North American agriculture. Tenancy has important advantages. Compared with purchasing, renting eases the capital burden for farmers, particularly in times of high land and capital prices. On the other hand, tenancy is also thought to have negative effects. With the rapid advance of soil erosion and soil degradation in North America (Agricultural Institute of Canada), questions have been raised about the effect of tenancy on soil management and its consequent effect on long-term soil productivity.

This paper will address the relationship between land tenure and soil management. Appropriate soil management is conducive to soil conservation (Elfring). Soil conservation occurs if soil management practices and investments in land improvement lead to higher yields over time compared with what these yields would be without the practices and investments.

The paper begins with a brief description of the change in land tenure after 1951 in the Canadian province of Ontario. Within the province, a particular area was selected in which a more detailed study was performed on the effect of tenancy on land productivity. The paper proceeds with an economic explanation of why tenancy is expected to affect soil productivity. Further, the characteristics of leasing in the survey area are described, since they have an important bearing on soil management practices. Then the rental market in the survey area is examined. There is some evidence that the market is fairly imperfect, which is expected to result in fewer soil improvement investments than in a more perfect market. Lastly, empirical evidence is provided of poorer soil management practices on rented land compared with that on owner-operated land and their consequent effects on crop yield.

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Changing Land Tenure Patterns in Ontario

A considerable change in land tenure patterns has occurred over the last three decades. In 1981, 24 percent of the agricultural land was operated under a leasing arrangement, while the corresponding figure for 1951 was 11 percent. Total acreage rented changed from 2.2 million in 1951 to 3.6 million in 1981, while total farmland declined by almost 6 million acres during this time period; from 20.8 million to 14.9 million acres (Statistics Canada).

The change in the proportion of land operated by the various tenure groups is even more remarkable. Owner-operators farmed 77 percent of the agricultural land base in 1951. This decreased to 49 percent in 1981. On the other hand, part-owners operated 47 percent of the land in Census farms in 1981, compared to only 16 percent in 1951. Rented land as a proportion of total land operated by this tenure group has remained fairly constant over time, around 40 percent. The proportion of the agricultural land base in the province operated by full-tenants decreased slightly, from 4.8 percent in 1951 to 4.3 percent in 1981 (Statistics Canada).

A remarkable change has occurred between the tenure groups renting land. In 1951, 55 percent of all land under a lease agreement

was rented by part-owners and 45 percent by tenants. This changed to 82 and 18 percent, respectively, in 1981 (Statistics Canada). Part-owners have become the dominant tenure group renting land.

Part-owners operate the largest farms. In 1981, provincewide this group operated farms which were on average more than twice as large as those of owner-operators or tenants. Farm expansion is particularly being pursued by part-owners and by owner-operators or tenants becoming part-owners. The average farm size of this tenure group has increased by almost 40 percent, from 210 to 313 acres, between 1951 and 1981, while the average farm size of owner-operators, although fluctuating over time, was in 1981 similar to that in 1951, namely 132 acres. The average farm size of full-tenants has increased by 14 percent during this time span from 114 to 130 acres (Statistics Canada). Since the number of part-owners is increasing, owner-operators must lease additional land or tenants must buy additional land. The latter is unlikely since this would not result in a higher proportion of rented land. This proportion has more than doubled and increased by 13 percentage points over the 1951–1981 period.

Leasing is apparently an important tenure form through which farm expansion occurs. It is difficult to predict whether this trend in increased leasing will continue. It is likely that farm expansion will prevail in the foreseeable future, although the average rate of farm expansion is declining. Further farm expansion would point to an expected increase in rented land. Obviously, this increase can only be realized if the supply of such land increases. Little is known about the potential supply of land under lease agreements.

Rental Survey

The advance of leasing over time poses some serious questions, particularly with respect to soil management and its effect on soil and crop productivity. In order to address these questions, soil management on rented land was compared with that on owner-operated land in an area covering seven counties in the agricultural heartland of Southwestern Ontario. A survey was conducted in 1981 among 1,404 part-owners who, according to Census information, rented land in 1976. The area chosen is a mixed farming area with emphasis on dairy. The questions related mainly to 1981. An estimated 30 percent no longer rented land in 1981. In total, 354 part-owners responded, yielding a 36 percent response rate.

The intent was to investigate whether this tenure group managed the soil on their rented land differently from that on their owned land. This tenure group was chosen because it is the most important group renting land. Moreover, a possible difference in management between owner-operated and rented land cannot be attributed to personal characteristics of the operator in this case.

Tenancy and Economic Decision-Making

Land tenancy is thought to affect soil conservation mainly for two important reasons. The first is insecurity of tenure due to short and informal leases. The second is that expected revenues and costs functionally related to the actions of a tenant are usually not incident on him (Ciriacy-Wantrup). Most lease contracts lack provisions for compensating tenants for the unused portion of an investment at the expiry data of the contract.

The above two factors lead to short planning horizons for the tenant. Most soil conservation investments and practices distribute their benefits over a much longer time span than the duration of the lease. Short planning horizons make such investments less attractive for the tenant and are therefore expected to discourage conservation expenditures. Tenure insecurity and revenue-cost sharing inequities between landlord and tenant are not innate to leasing, but stem from the leasing contract.

Unless all decision-making functions with respect to the use of land are contractually surrendered to the tenant, the owner could still be involved in decision-making, particularly in non-recurrent decisions such as investments in soil conservation. The tenant may abstain from these decisions for the above-mentioned reasons, but why would the landlord not undertake soil conservation investments? If they are economically viable, investments in land improvement should result in higher economic returns accruing to the land. These higher returns, however, do not necessarily result in higher rent receipts by the landlord.

There are several reasons why the landlord may abstain from making these investment decisions. He may lack information on the quality of his land and on the economic pros-

pects of investments (Carlson, *et al.*). This lack of information is expected to be closely associated with residence and occupation of the landlord. Absentee non-farm landlords are expected to be less knowledgeable than farmer landlords living on or near the property.

The form of the rental land market, particularly the degree of competition, is also expected to affect decision-making by the landlord, as will be explained under a separate heading. The rental land market appears to be fairly imperfect in the survey area. This may result in a discrepancy between the economic returns of the land and the contract rent.

Characteristics of Renting in the Survey Area

A few characteristics of renting in the survey area will first be provided in order to get a better insight into the effect of leasing on land conservation and on land productivity.

The total amount of land in the survey was 80,000 acres of which 29,500 acres were rented. Farm expansion occurred on 42 percent of the 330 farms surveyed over a five-year period prior to 1981. The expansion of farm size was most heavily dependent on land rental. Seventy percent of the acres added were rented. Farms which expanded did so by 116 acres on average of which 82 acres were rented.

The majority of the land, 60 percent, was rented from non-farmers, 29 percent from retired farmers, and 11 percent from active farmers. Land under absentee ownership (defined as owners residing outside the township in which the parcel is rented) amounts to one-quarter of the rented land. It is often claimed that absentee landlords, particularly if they are non-farmers, lack information about soil degradation and conservation practices, and that the communication between those landlords and the tenant is minimal (Ervin). Eighty-eight percent of landlords residing outside the township in which the parcel was rented were non-farmers.

One-year leases dominate in the survey area. Short-term leases increase uncertainty for the tenant and are expected to lead to a lower state of conservation compared with more certain tenure. These short-term leases, however, are no indication of a rapid turnover of tenants. On average, a tenant operated a rental unit for seven and one-half years. Fifty-five percent of the 590 rental units (a farmer may rent from more than one landlord) were leased by the same tenant for six years or more. A great discrepancy appears to exist between the number of years a parcel was rented by the same tenant and the length of the lease contract. A longer lease contract would, in the majority of cases, not have changed the mobility of the tenant, but would have had a profound effect on security of tenure and consequently on an expected increase in soil productivity. Although 82 percent of the lease contacts were for one year, 86 percent of the part-owners preferred a lease longer than one year.

Informal leases prevail. Seventy-seven percent of the 590 contracts were in verbal form, apparently with a minimum of contractual obligations on both parties. A written lease was used more frequently for larger units, a mean of 66 acres per unit compared to 47 acres on a verbal lease.

The Rental Land Market

Rents were mainly in the form of cash payments. Only 9 percent were crop-share leases or a combination of cash and crop-share. Cash rents varied in 1981 between $1 and $150 per acre, although 75 percent of the units rented between $20 and $80 per acre.

Contrary to expectations, no statistically significant relationship was found between overall soil quality and rent, nor between drainage quality and rent in an analysis of variance. After grouping the parcels into homogeneous climatic regions, the relationships between overall soil quality and rent and between drainage quality and rent were still insignificant within each group. This unexpected finding requires more research to examine whether or not such relationships exist. This, however, is beyond the scope of this paper. If these relationships are not significant, then the rental market in the area appears to be imperfect, at least with respect to these expected rent-yielding factors.

Market imperfection seems plausible. Many landlords lack information on the quality of their land, on the potential demand for their land, and on prevailing rents of similar properties. This is especially true for absentee landlords (Carlson, *et al.*, Ervn). Moreover, the rental market is quite informal. There are no auctions and hardly any professional agents mediating between landlord and tenant. This makes it hard to bring the market participants

together and be knowledgeable about prevailing trends and prices. It is particularly difficult for potential tenants to approach absentee landlords.

Imperfection in the rental land market is expected to exert a negative effect on soil conservation. It discourages the landlord from improving the land, since the rent he obtains from it is apparently not affected by the upgrading. It will also discourage the inclusion of compensation clauses in the contract. The landlord would be reluctant to make commitments to compensate the tenant at the time of termination of the lease contract for any deferred revenues which have not yet been recouped from investments made by the tenant. The unused portion of the investment cost for which the landlord is obliged to compensate under a compensation clause in the contract, is apparently not passed on to the following tenant in the form of a higher rent.

Soil Quality

The physical characteristics of land, such as soil texture, drainage, topography, erosion damage (loss of soil by water and wind), stoniness, periodic flooding and depth of bedrock are basic to soil productivity. Limitations of these physical features for agricultural production, resulting in decreased productivity, can be measured and expressed in encumbrance points (Noble). The number of encumbrance points assigned to each of these features of a particular parcel measures the degree of limitation of that feature for agricultural productivity. The minimum value which can be assigned to each physical feature is zero, indicating no physical limitation. The maximum value varies with the importance of the maximum limitation of that particular feature for agricultural production. Total land quality is represented by a summation of the encumbrance points of all soil features. Thus the higher the encumbrance points, the poorer the quality of the soil. The limitations of the above-mentioned physical characteristics of land are known for all owned and rented land parcels in the survey of those part-owners who rent land from one landlord.

Of all seven soil characteristics mentioned above, the average encumbrance points for each characteristic are higher on rented land than on operator-owned land, indicating poorer quality on rented land (see Table 1). The largest difference was found in the drainage component.

This difference in soil quality is not necessarily a reflection of tenure. The land could have been in a poorer state all along. What is important is that some of these features can be improved, such as drainage and stoniness, and others can be prevented from deteriorating, such as erosion damage. Poorer quality land needs different soil management practices. For example, sloping land which is susceptible to soil erosion needs crop rotations rather than monoculture of a row crop. Moreover, it may need practices such as strip cropping and contour farming. Land which is excessively wet needs tile drainage. Whether or not such practices are undertaken obviously depends on their economic profitability. The crucial point is that such practices may be profitable under operator-ownership, but not under tenancy. This point will be enlarged upon in the next section.

Table 1. Encumbrance Points of Various Soil Characteristics of Rented and Owned Land

Characteristic	Average Points Rented Land	Average Points Owned Land	Point Difference	Relative Point Difference in percent[1]	Possible Range
Soil texture	5.212	4.542	.670**	12.9	0–20
Drainage	8.810	3.516	5.294**	60.1	0–40
Topography	5.254	4.779	.475*	9.0	0–65
Erosion	2.096	1.288	.808***	38.5	0–20
Stoniness	8.535	7.484	1.051**	12.3	0–40
Flooding	2.069	1.291	.778**	37.6	0–30
Depth to Bedrock	3.435	3.080	.355	10.3	0–65

[1] Measures by what percentage the average soil characteristic of owned land is superior to that of rented land.
* Significant at the .05 probability level by a two-tailed t-test.
** Significant at the .01 probability level by a two-tailed t-test.
*** Significant at the .001 probability level by a two-tailed t-test.

Tenure and Soil Management Practices

Part-owners operate their owned land differently from their rented land. Crop rotation, manuring, erosion control and stone picking were performed more frequently on their owned land than on their rented land, while the quality of the rented land was lower and needed the practice more often. A good indication of the practice relative to the physical feature of the soil which is affected by the practice can be found in Table 2.

Where the practice was performed, the physical feature of the soil which is affected by the practice, was of lower quality than on land where the practice was not performed. This is true both for owner-operated and for rented land. However, more operators abstained from performing soil management practices on their rented land than on their owned land, while the physical features of their rented land were poorer than those on their owned land. For example, 16 percent of the operators practiced monoculture on their rented land while only one percent did so on their owned land. Nevertheless, on average, the erosion damage was higher on rented land where monoculture was practiced than on owned land where crop rotation took place (1.53 versus 1.29 encumbrance points). The rented land where monoculture occurred was also considerably steeper and therefore likely more erosion-prone than the owned land where no crop rotation took place (4.69 versus 2.65 encumbrance points).

On owner-operated land a different composition of crops exists than on rented land. In 1981, on owner-operated land 41 percent was in row crops (mainly corn) and 38 percent in sod crops. On rented land, the percentages were 50 and 25, respectively. Land in permanent pasture was relatively small, 8 percent on owned land, 5 percent on rented land. The average proportion of row crops on owner-operated land is statistically significantly different from the average proportion of row

Table 2. Difference in Soil Management Practices Between Owned and Rented Land Relative to Soil Quality

Soil Management Practice and Physical Feature of the Soil	Performing the Practice		Not Performing the Practice	
	Percent of operators	Average encumbrance points	Percent of operators	Average encumbrance points
Stone Picking				
Owned Land:				
(operators)	95		5	
Stoniness		7.83		1.96
Rented Land:				
(operators)	89		11	
Stoniness		9.14		4.01
Erosion Control[1]				
Owned Land:				
(operators)	69		31	
Erosion		1.36		1.13
Topography		5.04		4.18
Rented Land:				
(operators)	62		38	
Erosion		2.57		1.35
Topography		5.73		4.46
Rotation				
Owned Land:				
(operators)	99		1	
Erosion		1.29		.72
Topography		4.80		2.65
Rented Land:				
(operators)	84		16	
Erosion		2.21		1.53
Topography		5.38		4.69

[1] Strip cropping, contour ploughing, spring poughing, minimum till, etc.

crops on rented land at the .001 probability level by a two-tailed t-test. A similar statistical result is obtained between the average proportion of sod crops on operator-owned and rented land. Row crops, in contrast to sod crops, tend to deplete soil fertility and induce soil erosion on land which is susceptible to erosion unless proper crop rotation and erosion control measures are followed.

Manure is applied to a lesser extent on rented land than on owned land; only 12 percent of the rented acreage was manured against 35 percent of the owner-operated land. Where manure was applied on rented land, it was always on parcels near the farm headquarters.

Land improvements which yield their benefits over a long time period, such as tile drainage, terracing, and engineering works to control erosion, are expected to be heavily affected by future uncertainty and hence by uncertainty of tenure. The operators were asked whether or not their rented land needed any of these capital expenditures, and if so, whether they expected them to be undertaken in the next five years by either the landlord or themselves if renting continued. The question was also asked whether they would undertake the expenditure if they bought the parcel rather than continuing to rent it. Table 3 provides the results.

Capital expenditure was particularly needed for drainage, indicating the relatively poor drainage conditions on rented land. It is clear from the table that a change in tenure status from tenant to owner-operator, which is a change toward a more certain tenure situation, would lead to considerably greater capital expenditure for land improvement. For example, of those operators who expressed a need for drainage on their rented land, 56 percent expect drainage to be undertaken either by the landlord or by themselves if renting continued, but 90 percent of the current tenants would invest in it if they were able to buy the land.

The question remains why improvement practices and investments are less frequently undertaken on rented land. The practices could be profitable on owned land but not on rented land if the rented land is inherently inferior and consequently the marginal returns of management practices upgrading the land fall short of their outlay. On the other hand, profitability of the practices could depend on the form of tenure.

There are strong reasons suggesting that low improvement investments on rented land are not due to low marginal returns, but to insecure tenure. According to Table 1, column 4, the soil characteristics that cannot be modified by man such as soil texture, topography, and depth to bedrock exhibit relatively small quality differences between owned and rented land. On the other hand, those features that can be improved or their deterioration prevented, such as drainage, flooding, and erosion, show relatively large quality differences between owned and rented land. If rented land were inherently substantially inferior to owned land making improvement investments unprofitable, one would also expect relatively large quality differences in features that cannot be modified by man. Moreover, the results from Table 3 show that if the rented land were farmed under a more secure tenure form, improvement investments would be undertaken to a much greater extent, suggesting that their marginal returns are sufficient to encourage investment, but insecure tenure inhibits these investments.

Table 3. Capital Expenditures on Rented Land

Expenditures	Number of Operators Responding	Need for Expenditure	Expenditure Expected to be Undertaken in the Next Five Years	
			By tenant or landlord if renting were to continue	If land were purchased by the tenant
		%	%[1]	%[1]
Erosion works[2]	304	17	65	85
Drainage	305	81	56	90
Clearing[3]	307	33	66	94
Liming	294	5	74	95

[1] Expressed as a percentage of those operators who indicated a need for the expenditure.
[2] Grassed waterways, terracing, engineering works.
[3] Stone, fence, stump removal, etc.

Table 4. Differences in Grain Corn Yield Between Owned and Rented Land by Drainage Quality

Number of Operators	Percentage Yield Difference Between Owned and Rented Land	Drainage Encumbrance Points		
		Owned Land	Rented Land	Difference
5	31 or more	5.68	15.35	−9.67**
16	16 to 30	3.57	8.83	−5.26*
30	6 to 15	3.25	7.95	−4.70**
16	0 to 5	6.34	8.98	−2.63
45	same	3.96	5.72	−1.76
3	−5 to 0	3.83	2.33	1.50

* Significant at the .05 probability level by a two-tailed t-test.
** Significant at the .01 probability level by a two-tailed t-test.

Grain Corn Yields on Operator-Owned and on Rented Land

As shown in Table 3, 81 percent of the operators indicated that their rented land needed investment in drainage. On average, drainage on rented land is in a considerably poorer state than on owner-operated land, revealed by the average drainage encumbrance points, which are 3.8 on operator-owned land and 8.1 on rented land. The poorer drainage condition affects yields. The average corn yield per acre of part-owners in 1981 was 112 bushels on their owned land and 105 bushels on their rented land.

As can be seen from Table 4, the variation in yield difference corresponds to the variation in drainage quality between owned and rented land. For example, where owned land was in better drainage condition, with a difference of about 10 encumbrance points, corn yields on operator-owned land were 31 percent or more higher than on rented land. On the other hand, where the difference in drainage quality was equivalent to around 2 points (this difference was not statistically significant), yields on operator-owned and on rented land were the same. The items in Table 4 follow a consistent pattern. On three properties drainage quality of rented land was somewhat higher than on operator-owned land, resulting in higher yields on the rented land.

Under prevailing leasing conditions in the survey area, drainage on rented land is not expected to be upgraded to the same extent as would be the case under more secure land tenure (see Table 3). This results in lower yields than could have been obtained under more secure land tenure.

Concluding Remarks

Leasing of agricultural land has gained in importance over the last three decades. It plays an especially important role in farm enlargement. Leasing in the survey area is characterized by short, informal arrangements with a minimum of contractual obligations. This leads to tenure insecurity and revenue-cost sharing inequities between landlord and tenant. This in turn is detrimental to soil conservation and soil productivity.

Although these findings pertain to a specific region in Ontario, it is reasonable to assume that the results apply equally to all rented land subject to considerable insecurity of tenure and revenue-cost sharing inequities between landlord and tenant. These characteristics prevail in large parts of North American agriculture under tenancy.

The negative effects are not innate to leasing itself. They are more the result of the content of the contractual arrangement. These are subject to change. These changes are difficult to attain without supportive policy and legislation. Many countries in Europe have extensive tenancy legislation, in contrast to North America. As a consequence, cultivation of rented land in Europe is not significantly different from that on owner-operated land.

The promotion of longer-term leases appears to be needed. It is even more important to ensure that expected revenues and costs, functionally related to the actions of a tenant, whether soil depletion or improvement practices, are incident on him. Compensation is an important mechanism to ensure more equitable revenue-cost sharing between tenant and landlord. Most arrangements in North America lack this mechanism.

With the rapid advance of leasing in North American agriculture and the associated negative effects on maintaining soil productivity over time, it is of utmost importance to establish an institutional framework accommodating leasing and soil conservation simultaneously. This is unlikely to occur without government support. Both ignorance and an attitude to resist more government interference in the industry may explain why tenancy ranks so low on the agricultural policy agenda. Without the demand and support of the farming community, governments may be reluctant to step in. The farming community and governments must be convinced that new institutional arrangements are of vital importance to maintain or increase agricultural productivity of rented land over time.

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