Farmland Rental Contracts: Why Do Some Contracts Stipulate Production Practices in Ontario and Manitoba?

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Qin Luo

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ABSTRACT

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Qin Luo
University of Guelph, 2015

Advisory Committee:
Dr. B. James Deaton (Advisor)
Dr. Alfons Weersink (Committee Member)

In 2011, 42% of Canadian farmland was in the rental market. Some of these rental agreements include stipulations that a tenant implement certain production practices. This thesis empirically investigates factors that motivate stipulations by analyzing a telephone survey dataset of farmers in Ontario and Manitoba (n=441). Based on the empirical findings, I conducted an additional personal interview to explore issues associated with stipulations (n=59). The empirical results identify key covariates that influenced the adoption of stipulations. For example, farmers renting from family members are less likely to have a stipulation in their rental contract. The personal interviews also reveal that many landlords ask tenants to avoid specific production practices that may limit future uses of the land for non-agricultural purposes. Hence, in regions with high urbanization pressure, landlords may stipulate practices that are in potential conflict with social objectives as set forward by the government.
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Table of Contents
ABSTRACT .......................................................................................................................... ii
Acknowledgement ........................................................................................................... iii

Chapter 1. Introduction and Thesis Outline ..................................................................... 1
1.1 Land Tenure and Best Management Practices ...................................................... 1
1.2 Farmland Rental Contracts ..................................................................................... 3
1.3 Research Significance and Objectives ................................................................... 5
1.4 Thesis Organization ................................................................................................. 6

Chapter 2. Literature Review ......................................................................................... 7
2.1 Contract Types and Lengths ..................................................................................... 7
2.2 Conservation on Rented Land and Contract Stipulation ......................................... 10
2.3 Factors Influencing Contract Type and Adjustment Clauses ................................... 11
2.4 Factors Influencing BMP Adoptions ....................................................................... 13
2.5 Methods .................................................................................................................... 15
2.6 Summary ................................................................................................................... 16

Chapter 3. Economic Theory and Hypotheses ............................................................... 18
3.1 Kinship and Social Capital ...................................................................................... 18
3.2 On-farm Landowner and Externality ...................................................................... 19

Chapter 4. Methods and Data ....................................................................................... 23
4.1 Survey Summary ...................................................................................................... 23
4.2 Data Summary .......................................................................................................... 26
4.3 Summary ................................................................................................................... 30

Chapter 5. Empirical Model .......................................................................................... 32
5.1 Model Specification .................................................................................................. 32
5.2 Interaction Terms ..................................................................................................... 34
5.3 Sensitivity Analyses ................................................................................................. 35
5.4 Variable Summary .................................................................................................... 35

Chapter 6 Results and Discussion ................................................................................. 40
6.1 Results ...................................................................................................................... 40
6.2 Discussion ................................................................................................................ 45

Chapter 7. Follow up Study in the Lake Simcoe Watershed .......................................... 47
7.1 Background .............................................................................................................................................. 47
7.2 Method and Data ...................................................................................................................................... 48
7.4 Discussion ............................................................................................................................................... 57
   7.4.1 The Bobolink Regulation and Stipulation Motivation ................................................................. 57
   7.4.2 Landowners’ Intent to Eliminate Externality .............................................................................. 59
   7.4.3 Contract Attributes ...................................................................................................................... 60
   7.4.4 Non-farming Investors ................................................................................................................. 60
Chapter 8. Summary and Policy Implications ............................................................................................... 61
   8.1 Summary of Findings from the Ontario and Manitoba Survey ....................................................... 61
   8.2 Summary of Findings from the Lake Simcoe Interview .................................................................... 62
   8.3 Comparison of Findings in the Two Surveys .................................................................................... 62
   8.4 Policy Implications ............................................................................................................................ 63
References ..................................................................................................................................................... 65
Appendix A: Lake Simcoe Watershed Farmland Conservation Survey .................................................... 68
Appendix B: Information Letter .................................................................................................................. 108
Appendix C: Glossary (Alphabetical, By Category) .................................................................................... 109
Appendix D: Biosafety Information Handout ............................................................................................ 110
List of Figures

Figure 1. Percentage of Farmland Rented In Acres from 1976 to 2011 by Census Year in Canada, Ontario and Manitoba................................................................. 2
Figure 2. Externality and the Kinship between Landlord and Tenant.................................................... 19
Figure 3. Production Externality and the Presence of Landowner on the Farm .................................. 21
Figure 4a. Map of Ontario Census Regions and Divisions (Study Region Highlighted) ..................... 24
Figure 4b. Map of Manitoba Census Regions and Divisions (Study Region Highlighted) ................. 25
Figure 5. Percentage of Rental Contracts with Stipulation Provisions Concerning Specific Production Practices ......................................................................................... 26
Figure 6. Contracts and Stipulations by Landowner Category ................................................................ 29
Figure 7. Oral and Written Contracts across Stipulation Categories ................................................... 29
Figure 8. Responses to Whether Some Farmers Use More Fertilizer or Manure on Owned Land than Rented Land........................................................................................................... 30
Figure 9. The Lake Simcoe Watershed Defined by the Ministry of Environment ................................ 50
Figure 10. Category of Stipulating Landlords....................................................................................... 53
Figure 11. Residence Location of Stipulating Landlords...................................................................... 53
Figure 12. Tenants’ Opinions of Why Landlords Stipulate ................................................................. 55
Figure 13. Form of Stipulation.............................................................................................................. 56
Figure 14. Land Quality under Stipulation ............................................................................................. 56
Figure 15. Proximity of Land to Wetlands, Rivers and Streams under Stipulation ............................... 57

List of Tables

Table 1. Empirical Studies of Factors Affecting Contract Choices and BMP Adoptions............................. 17
Table 2a. Mean Rental History between Landowner and Tenant ............................................................ 27
Table 2b. Mean Plot Size ........................................................................................................................ 27
Table 2c. Mean Age of Tenant................................................................................................................. 28
Table 2d. Mean Share of Owned Land out of Operated Acreage ............................................................ 28
Table 3. Interaction between Home and Family on the Means of Stipulation .................................................. 35
Table 4. Variable Summary and Expected Signs ..................................................................................... 38
Table 5. Probit Results for the Base Model Regarding Any Stipulation .................................................. 41
Table 6. Probit Results for Stipulation Regarding Specific Practices ...................................................... 43
Table 7. Sensitivity Analyses and Comparison with the Base Model ...................................................... 44
Table 8. Stipulations by Production Practices......................................................................................... 52
Table 9. Stipulation for development purposes and other purposes .......................................................... 55
Table 10. Difference in the Findings from the Two Surveys ................................................................. 63
Chapter 1. Introduction and Thesis Outline

1.1 Land Tenure and Beneficial Management Practices

According to the 2011 agricultural census (Statistics Canada 2012), more than 41 million acres of farmland was rented, leased, or crop-shared in Canada. In Ontario and Manitoba, the figures were 4 million acres and 5 million acres respectively. Figure 1 reviews trends in the farmland rental market over the last forty years. In 1976, only 30 percent of Canadian farmland was rented, compared to 29 percent in Manitoba and 23 percent in Ontario. In 2011, 42 percent of Canadian farmland was in the rental market, compared to 40 percent in Manitoba and 35 percent in Ontario. For both provinces and Canada, the percentage of farmland being rented has increased over the last 40 years. This implies that a large percentage of farmland is governed by rental agreements between landlords and tenants. The size of the farmland rental markets stresses the importance of how landowners influence the production practices carried out by their tenants. Some of the landowners may stipulate certain production practices (e.g., tillage practices, crop rotation, etc.) to be adopted on the land. This thesis examines these stipulations and the factors that influence their emergence.

Landowner’s stipulation of tenant’s production practices is nontrivial, also because production practices influence soil fertility, environmental quality and wildlife habitat. Soil erosion removes organic matters from the soil and reduces farmland fertility. Fertilizer, manure and herbicide applied on farmland can also be carried with sediment into streams, rivers, and other water bodies. According to Ontario Ministry of the Environment (MOE) and Lake Simcoe Region Conservation Authority (LSRCA) (2013), water contamination caused by farmland runoffs can increase algae concentration, diminish drinking water quality, and endanger fish species and other cold-water species. In response to these concerns, Beneficial Management Practices (BMPs) –
“practical, affordable approaches to conserve a farm's soil and water resources without sacrificing productivity (Ontario Ministry of Agriculture and Rural Affairs 2014)” – are often promoted by scholars, farm organizations, and government agencies.

Figure 1. Percentage of Farmland Rented In Acres from 1976 to 2011 by Census Year in Canada, Ontario and Manitoba

Source: Statistics Canada (2012)

According to Prairie Farm Rehabilitation Administration (Hilliard and Reedyk 2000), there are three general types of agricultural BMPs: (1) nutrient management and integrated pest management; (2) methods to control erosion and runoffs; (3) barriers and buffers. Nutrient management and integrated pest management reduce fertilizer, pesticide, and herbicide inputs to the level of crop uptakes or pest control targets, in order to avoid potential contamination by excess chemicals (Hilliard and Reedyk 2000). Methods to control erosion and runoffs, like cover crops, reduce the movement of nutrients and other chemicals from farmlands (Hilliard and Reedyk 2000).
Barriers and buffers, such as grassed waterways, capture sediments and nutrients from agricultural runoffs (Hilliard and Reedyk 2000).

Given the amount of farmland in the rental market and the perceived importance of BMPs, it is not surprising that researchers have explored the question of whether farmers treat the land they rent in a similar manner as the land they own. As Carolan et al. (2004) suggested, BMP adoption requires long-term investments in both management and equipment. However, these long-term commitments conflict with the short-term nature of farmland rental arrangements. Additionally, due to the intense competition among tenants, farmers now operate with a smaller profit margin and on more scattered land, which further impairs conservation behaviour on rented land (Hufferd and Gee 2000; Carolan et al. 2004). Despite all the barriers to adopt conservation practices on rented land, the trend of farmland rental in North America is upward. As a tenant in Carolan et al.’s (2004) focus group claimed, if sustainable agriculture is going to work, it needs to work first on rented land.

1.2 Farmland Rental Contracts

Previous research has made great efforts to understand farmland rental contracts (Allen and Lueck 1992a; 1992b; 1999; 2008; Rainey et al. 2005; Huffman and Fukunaga 2008; Fukunaga and Huffman 2009; Bierlen and Parsch 1996). Most of the studies focused on types of contracts by different payment options, such as cash-rent, crop share and cost share, and the effect of these contracts on BMP adoption (Allen and Lueck 1992a; Allen and Lueck 1999; Allen and Lueck 2008; Rainey et al. 2005; Huffman and Fukunaga 2008; Fukunaga and Huffman 2009). Comparatively, much less attention has been paid to specific contract terms and provisions concerning farming practices. In Nadella's (2013) study on factors influencing the adoption of conservation practices, some tenants indicated that their rental agreements included stipulations
regarding production practices (e.g., minimum tillage and crop rotation). However, Nadella’s (2013) survey did not capture the content of these stipulations. Van Vuuren, Larue and Ketchabaw (1995) evaluated the effects of tenant, contract and farm characteristics on the decision to adopt conservation practices. They found that stipulation provisions in the contracts significantly increase manure application and the use of plowdown crop. However, the authors did not examine the factors influencing stipulations. Before attempting to address this gap, I discuss the characteristics of farmland rental contracts, including form, payment type, and specification of production practices.

Farmland rental contracts are often described as “handshake” deals. Typically they are simple in terms of detail and formality (Allen and Lueck 1992b). These rental contracts are often oral contracts, and the written ones are very brief in form (Allen and Lueck 1992b). Typically, over half of the rental contracts are oral. In Nadella’s (2013) data for Ontario and Manitoba, 63 percent of contracts are oral arrangements. In Allen and Lueck’s (2008) study, oral contracts take up 58 percent of the total in Nebraska-South Dakota, and 54 percent in British Columbia.

Despite the informality of these contracts, they are typically well enforced (Allen and Lueck 1992a; Gray and Turner 1924). Local farming community is a small group that conducts repeated businesses, hence reputation is highly valued (Allen and Lueck 1992b). If one party breaches the contract, word spreads fast among other tenants and landlords (Allen and Lueck 1992b). Therefore, these handshake contracts may be enforced by the reputational consequences that are associated with breaching the contract.

However, it is not common for farmland rental contracts to include stipulations for specific practices (Allen and Lueck 1992a; Gray and Turner 1924). As mentioned by Allen and Lueck (1992a) and Gray and Turner (1924), usually the contracts merely require a “thorough and farmer-
like”, or “good and husband-like” manner when farming the land. Such provisions only demand local customary farming practices. Allen and Lueck (1992b) claimed that because farming practices in a geographic region are generally homogenious, any bad practices can be easily identified from the customs. Therefore simple contracts are implicitly enriched by local customary practices (Allen and Lueck 1992b). Gray and Turner (1924) held a different opinion that prevailing practices can be good or bad. For instance, if conventional tillage is prevalent in the region, the clause only demands the tenant to not violate the convention, which is not necessarily the best solution. Land quality would be better protected if landlords enforce specific farming practices by contract terms (Gray and Turner 1924).

1.3 Research Significance and Objectives

Understanding the drivers of stipulation provisions will help government agencies and landowners effectively promote farmland conservation behaviour. However, as my results will point out, some stipulations intend to ensure private interests and are in potential conflict with objectives set forward by the government. Understanding the nature of these stipulations will help the government evaluate existing policies and mitigate unintended consequences.

The objectives of this research are to characterize stipulation clauses, and to identify key factors that influence whether a landowner stipulates a particular production practice. To achieve these objectives, the following methods were used:

(a) To identify factors that may influence whether or not rental contracts include stipulations concerning BMP adoptions, by reviewing previous literature.

(b) To empirically assess the impact of identified factors on the stipulation decision, using a phone survey in Ontario and Manitoba.
To understand the nature of stipulations and to compare the empirical results with data gathered from the in-depth Lake Simcoe follow-up interview.

1.4 Thesis Organization

The remaining chapters of the thesis are organized as follows. Chapter 2 reviews the literature on farmland rental contracts, focusing on payment types and contract terms, in order to identify important factors that influence contract choice. These factors are used to support my empirical analysis. Chapter 3 provides the theories that underline the regression and the statistical model. Two testable hypotheses were developed. The first hypothesis is that stipulation is less likely to happen between family members. The second hypothesis is regarding the presence of landowner on the farm (i.e., if the landowner lives on the farm, then he/she is motivated to use a stipulation clause to offset the externality generated by farming). Chapter 4 includes a description of the survey and data. Chapter 5 presents the results of empirical analysis. Chapter 6 interprets and discusses the results. Chapter 7 introduces the Lake Simcoe follow-up study. The findings in Ontario and Manitoba are compared to the findings in the Lake Simcoe Watershed. It is also discussed how and why the two sets of surveys generate similar or conflicting results. And in Chapter 8, conclusion and implications of the study are provided. I explain in this chapter how the government can use the findings to effectively promote farmland conservation, and how individual landowners can protect the land quality by negotiating contract terms and stipulations.
Chapter 2. Literature Review

This chapter sets out to review previous studies related to farmland rental contracts and the factors influencing contract choice. I first review the types and lengths of farmland rental contracts and their application, to understand the characteristics of different contracts. Then I review studies of farmland conservation on rented land and the stipulation of conservation behaviour in rental contracts, in order to identify the key factors influencing BMP adoption. Because the literature on contract stipulation is limited, I briefly review previous studies on factors influencing two contract choices: contract type and adjustment clauses in cash-rent contracts. Table 1 at the end of this chapter provides a summary of the context, methods, and findings of these studies. The table reveals that most of the studies take on a binary dependent variable, and that logit and probit models are widely used to investigate contract choices. A detailed discussion of each study is provided in sections 2.2, 2.3, and 2.4.

2.1 Contract Types and Lengths

Renting is the second prevalent way, after inheritance, by which a farmer gains sufficient operating acreage to remain financially feasible (Rainey et al. 2005). In North America, approximately 40 percent of farmland is operated under rental contracts (Allen and Lueck 2008; Statistics Canada 2012). Farmland renting enables operators to farm more land with fewer assets, lower debt load, and lower financial risks (Rainey et al. 2005). Before analyzing the contract terms and provisions, it is necessary to understand different types and lengths of farmland rental contracts.

There is a rich literature focusing on the three major types of farmland rental contracts—cash-rent, crop share, and cost share. As defined by Allen and Lueck (1992a), cash-rent contracts refer to the arrangement under which “the farmer pays a fixed annual amount per acre of land and owns the entire crop.” In contrast, under a crop share contract, “the tenant is responsible for all
operating expenses but shares the crop output with the landlord” (Rainey et al. 2005). A cost share contract is often seen as a variation of crop share contracts, because besides sharing the crop output, the tenant also shares the operating expenses with the landlord (Rainey et al. 2005). Hence in this thesis, I mainly discuss cash-rent and crop share. The most common crop share rates are 50 percent, 60 percent, and 67 percent, with the majority of observations ranging between 50 percent and 75 percent (Allen and Lueck 2008). In cost share contracts, the cost share rate usually equals the crop share rate (Allen and Lueck 2008). Many studies have been conducted to investigate the choice of farmland contract type. Ninety years ago, Gray and Turner (1924) had illustrated the trade-off between cash-rent and share arrangements: while cash-rent is beneficial for experienced tenants who are reluctant to share their operation success with the landlord, a share arrangement lends younger, unexperienced tenants the capital and expertise they need from the landlord. According to Allen and Lueck (1992a), in a cash-rent agreement both parties avoid the cost of dividing the output; whereas in a share agreement, the landlord has control over the overexploitation of farmland. Since the landlord’s income is proportional to the total output under share contracts, he/she is then motivated to provide expertise and capital, with an expectation of higher return for his/her contribution (Gray and Turner 1924). In a risk-sharing perspective, in a cash-rent contract, the tenant bears all the risk; while in a crop share contract, the landlord and the tenant share the risk involved in production and marketing (Huffman and Fukunaga 2008).

In addition to the type of farmland contracts, these rental agreements also come in different lengths: multiyear or annual. A multiyear contract usually refers to a two- to three-year contract, with an extreme of five years (Allen and Lueck 1992b). Multiyear contracts have lower transaction costs because less negotiation for renewal is required. However most of the time, annual contracts are chosen over multiyear contracts. Annual contracts have the elasticity to adjust to the economic
changes in terms of market price (Allen and Lueck 1992b). To account for the rapid changes in the market, some multiyear contracts have an adjustable provision to offset the difference between market conditions and the contract terms (Allen and Lueck 1992b). An exception is crop-share contract, where a fixed proportion of output is committed, regardless of change in prices (Allen and Lueck 1992b). In non-farmland contracts, long-term contracts are used by both parties to avoid the appropriation of sunk assets\(^1\) that are specific to the transaction (Klein et al. 1978). For example, in order to ensure return from the investment in equipment that produces one specific product, the supplier would prefer a long-term contract with the retailer. However, in farmland contracts, it is difficult to extract the other party’s quasi-rents\(^2\) by appropriation (Klein et al. 1978). Landowners only provide land, while tenants provide human capital (farming skills), buildings, and equipment (Allen and Lueck 1992b). These production factors are not as specific to the transaction as those involved in non-agricultural rental agreements, such as coal or natural gas contracts, therefore there is less necessity to prevent appropriation (Allen and Lueck 1992b). In the meanwhile, tenants who invest heavily in the land would seek more security by a longer lease or a compensation clause (Gray and Turner 1924). One thing to be noted is that short-term contracts do not imply short-term occupation of the land. A tenant can have a one-year contract that gets renewed annually for decades. According to Gray and Turner (1924), annual contracts result in longer tenure than multiyear contracts do.

\(^1\) Sunk assets refer to assets that are specialized for some activities and cannot be readily diverted to other uses (OECD 2003).

\(^2\) Quasi-rents are earnings of production factors that are temporarily in fixed supply (OECD 2002)
2.2 Conservation on Rented Land and Contract Stipulation

Although impact of different contract types (crop share and cash-rent) has been extensively investigated, less research has been done on the effect of other contract terms and features on BMP adoption. Since many landowners live out of the county, province, or even the country their land is located in, monitoring of production practices by landlords is minimal (Allen and Lueck 1992a). Therefore, stipulations in farmland contracts considerably contribute to conservation efforts on rented land (van Vuuren et al. 1995). Since the benefit of BMPs, like crop rotation and minimum tillage, usually accrue after the expiry of the current contract, a compensation clause or a longer rental period would enhance tenure security\(^3\), and therefore improve the adoption rate (van Vuuren et al. 1995). Carolan et al. (2004) identified a case example of compensation, where the tenant and landlord agreed that when the land was rotated in hay, the rental rate was reduced by 20 percent, in order to account for the additional cost.

Van Vuuren, Larue and Ketchabaw (1995) found that contract provisions stipulating a certain practice significantly improve the adoption of BMPs (see 2\(^{nd}\) row of Table 1). In terms of individual practices, van Vuuren et al. (1995) found that contract stipulation is significant in influencing the adoption of manure application and plow-down crops respectively. When no-till, strip cropping, contour farming, cover crops, and minimum tillage are grouped as erosion control practices, impact of contract stipulation is further strengthened. Similarly, contract stipulation is highly significant on the adoption of compaction correction practices, which consist of minimum tillage and cover crops. Although contract stipulation is important in conserving rented land, there

\(^3\) Tenure security refers to the “certainty that a person’s rights to land will be recognized by others and protected in cases of specific challenges (United Nations 2002).”
is paucity in literature on the nature of these stipulation clauses: what they are and why they are present. This study fills the void by exploring the nature of these contract stipulations, identifying and evaluating the factors that drive the development of the stipulations.

2.3 Factors Influencing Contract Type and Adjustment Clauses

As the literature on contract stipulation of conservation practices is very limited, I briefly review the literature regarding factors influencing different contract types and adjustment clauses in cash-rent contracts. In order to summarize the categories of factors that influence contracting decisions, I discuss findings of crop, land, tenant, and landowner characteristics in the literature.

Allen and Lueck (1992a) used a list of crop and land characteristics to test their influence on the choice between cash-rent and crop share (see 3rd row of Table 1). Under the crop category, the authors included hay crop (e.g. barley, hay and wheat) and row crop (e.g. corn, potatoes and soybeans). The authors argue that because hay crops do not require intensive tilling, and there is minimum soil manipulation, landowners are less worried about soil exploitation. Therefore, crop-share contracts are less likely with hay crops. Row crops, however, require intensive tillage and is more exposed to the possibility of soil exploitation. Unlike hay crops, row crops result in an increase in the likelihood of crop share contracts, as crop share contracts limit tenants’ exploitation of soil (Allen and Lueck 1992a). Landowners are not as worried about tenants exploiting soil moisture on irrigated land, so the authors found a negative relationship between irrigation and crop share contract. The other land characteristic is urbanization level, which indicates alternative uses of the land. Allen and Lueck (1992a) suggested that if the land has good potential outside of agriculture, then the landowner is less concerned about soil exploitation, and more likely to choose a cash-rent contract.
Effects of tenant and landowner characteristics on contract type were also examined. For tenant characteristics, Allen and Lueck (1992a) included kinship, age, capital, and farm income. The authors found that crop-share contracts are more likely among families. Allen and Lueck (1992a) expected greater tendency for older farmers to choose cash-rent than younger farmers. This hypothesis can be explained by Gray and Turner's (1924) argument, that younger tenants benefit from the landowner’s support that crop-share contracts provide, while older tenants want to avoid sharing their success with the landowner. Surprisingly, Allen and Lueck's (1992a) analysis failed to support this hypothesis. With the assumption of risk-averse tenants, Allen and Lueck (1992a) predicted higher possibility of crop-sharing as the tenant shares the production risk with the landowner. But the data again refuted this hypothesis. The authors found that the capital that a tenant owns is negatively correlated with crop-sharing, although the coefficient is insignificant. They explained that since tenants with fewer assets face a capital constraint when rent is required in advance, they are more inclined to choose crop share. In the landowner category, Allen and Lueck (1992a) used absentee landowner and farm income. Although it is widely held that absentee landowners face higher costs to participate in the farming activities and are more likely to choose cash-rent. However, in the authors’ model, the negative relationship between absentee landowners and crop share contracts appeared to be insignificant. Under the assumption that landowners are risk-averse, the authors believed that landowners prefer cash-rent to crop-share and the data confirmed their expectation.

In the same study, Allen and Lueck (1992a) also investigated the factors influencing the inclusion of adjustment clauses in cash-rent contracts. In the sample collected from Nebraska and South Dakota, 10 percent of cash-rent contracts include a provision to increase the cash-rent when there is a bumper crop. This clause is used by landowners to prevent soil exploitation and to
account for the overexploitation of soil associated with high output level. Similar to the model of contract type, adjustment clauses are more likely to be present when exploitation risk is high (Allen and Lueck 1992a). With hay crop and irrigation, such risk is relatively low, so an adjustment clause is less likely to be imposed. The authors expected a negative effect of urbanization level, because the cost of soil exploitation lowers as the land has alternative uses. However their analysis actually proved the opposite, which Allen and Lueck (1992a) failed to explain. The kinship between tenant and landowner surprisingly revealed a higher likelihood of adjustment clauses between families. The authors then came to a counter-intuitive claim that soil exploitation is more likely to occur among family members rather than strangers.

Huffman and Fukunaga (2008) included more independent variables than Allen and Lueck (1992a) did (see 4th row of Table 1). They used five categories of factors: regions, tenant’s farm type, other tenant’s attributes, landlord’s attributes, and other factors. They placed their emphasis on risk-aversion factors and transaction cost factors. Two proxies the authors suggested for transaction costs are whether the landlord lives on the contracted land, and whether the landlord lives close to the contracted land. They claimed that landlords who live off the farm face higher monitoring cost to avoid abusive use of the land, and would prefer a crop-share contract to incentivise the tenant’s sustainable management of the land.

2.4 Factors Influencing BMP Adoptions

Because the subject of this thesis is contract stipulation of BMP adoption, it is also necessary to consider key factors that influence BMP adoption. Although factors influencing contract stipulation and BMP adoption would be different, I intend to borrow factors identified in the BMP literature to capture the features of the BMPs in my analysis.
Prokopy et al. (2008) synthesized 55 articles on BMP adoption and identified the most important factors that influence farmers’ adoption decision (see 1st row of Table 1). They categorized the independent variables into capacity, attitude, environmental awareness, and farm characteristics. By using a vote count methodology, Prokopy et al. (2008) found that capacity factors like education levels, income, acres, capital, diversity, labor, and access to information appear to be positively significant in adoption decisions. Previous studies present mixed evidence on the effects of attitudes and environmental awareness and hence lack the consistency to draw any conclusion (Prokopy et al. 2008). As the authors pointed out, further studies are needed for BMP adoptions on farmlands adjacent to streams and with different soil quality, because farm characteristics have not been extensively studied. Prokopy et al. (2008) also found that most of the studies on BMP adoptions focused on soil erosion and nutrient management, while other practices received much less attention, which reveals necessity for future research.

Van Vuuren et al. (1995) separated BMPs into two categories: recurrent practices that occur annually, and intermittent practices that require durable commitments (see 2nd row of Table 1). For example, manure application, minimum/no tillage, and cover crops are recurrent practices; while drainage is an intermittent practice. The authors found that, rather than expected occupancy or kinship, years rented significantly improve the adoption of annual practices in the form of tenure security. Debt load, age, and soil characteristics were found to be insignificant in influencing annual practice adoptions, while contract duration and stipulations exert a significant effect (van Vuuren et al. 1995). The adoption of intermittent practices was found to be significantly influenced by expected occupancy of the land and compensation clauses (van Vuuren et al. 1995). Contract duration, debt load, and soil characteristics were not significant factors influencing the adoption of intermittent practices (van Vuuren et al. 1995). In terms of findings on individual BMPs,
adoption of no-till is dependent on whether the practice-specific equipment is used on the tenant’s owned land, instead of characteristics of land or tenant. Meanwhile, participation in stewardship programs and compensation clauses in the contract also significantly improve the adoption frequency. The decision to apply manure is positively affected by years rented, contract duration, and contract stipulation. Both plow-down crops and winter cover crops are more likely to be adopted with longer contracts and on fruit and vegetable farms. Adoption of plow-down crops are also positively associated with years rented, contract stipulation, and proportion of rented land out of operating acreage. Alternatively, adoption of winter cover crops is significantly improved by participating in stewardship programs.

Although Prokopy et al. (2008) and van Vuuren et al. (1995) studied BMP adoption, instead of contract stipulation, their findings suggest a broader selection of BMPs in future studies, and provide a list of factors that complements the factors identified in the contract choice literature.

2.5 Methods

Because of the dearth of literature on contract stipulation of BMP, I again review previous studies on factors that influence contract types and terms. Most of the studies adopted a probit or logit model (see 2nd column of Table 1).

Huffman and Fukunaga (2008) used the probit model to examine factors influencing contract type. Contract type is a binary dependent variable, which equals 1 when a crop-share contract is present, and equals 0 when a cash-rent contract is present. The authors ran the model with and without landlord’s attributes, and demonstrated the marginal effects of all attributes listed.

Allen and Lueck (1992a; 1999) used the logit model in their analyses. To testify the hypothesis that a crop-share contract is chosen over a cash-rent contract as output variability increases, Allen and Lueck (1999) used a logit model with crop-specific samples (see 5th row of
Table 1). Coefficients of variation and standard deviation at the regional level and county level were examined. In the article they published earlier, Allen and Lueck (1992a) also used the logit model to examine the factors influencing the inclusion of adjustment clauses in cash-rent contracts.

2.6 Summary

Although the choice between contract types, especially crop-share and cash-rent, have been well examined, studies that focus on a specific contract term or clause are relatively rare. According to van Vuuren et al. (1995), clauses that specify farming practices are highly significant for adopting erosion control (e.g., no-till, strip cropping, and winter cover crops) and compaction correction practices (e.g., chisel plowing, plowdown crops and winter cover crops). However it is still unclear what these contract stipulations are, and under what circumstances they exist.

Because of the paucity of literature on contract stipulation of BMP adoption, I reviewed factors influencing contract types and adjustment clauses in cash-rent contracts. It was found that contract choices are influenced by a combination of tenant, landowner, and farm attributes (Allen and Lueck 1992a; Huffman and Fukunaga 2008; Allen and Lueck 1999). Compared with research on contract choice, factors used in BMP adoption analysis are very similar but more focused on the features of BMPs. Considering the purpose of this thesis, I will employ factors from both types of studies.
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Model/method</th>
<th>Context</th>
<th>Dependent variable</th>
<th>Explanatory variables</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prokopy et al. (2008)</td>
<td>Vote count</td>
<td>25 years of literature on the adoption of agricultural BMPs</td>
<td>Adoption of BMP (binary)</td>
<td>Capacity, attitude, environmental awareness, farm characteristics</td>
<td>Education levels, capital, income, farm size, access to information, positive environmental attitudes, environmental awareness, and utilization of social networks are some of the factors that improve BMP adoption.</td>
</tr>
<tr>
<td>van Vuuren et al. (1995)</td>
<td>logit</td>
<td>Southern Ontario, 1989, farmers who rented land</td>
<td>Adoption of productivity enhancing and environmentally benign farm practices (binary)</td>
<td>Tenant, contract and land characteristics</td>
<td>Stipulation clauses are highly significant for adopting erosion control and compaction correction practices.</td>
</tr>
<tr>
<td>Allen and Lueck (1992)</td>
<td>logit</td>
<td>Nebraska and South Dakota, 1986, farmers and landowners</td>
<td>A. Contract type (binary, crop-share vs. cash-rent) B. Inclusion of adjustment clauses in cash-rent contracts (binary)</td>
<td>A. Crop, land, tenant and landowner characteristics B. Irrigation, hay crop, row crop, urbanization, kinship, acres</td>
<td>The transaction-cost approach is a useful tool for understanding the choice of contract types. Cash-rent contracts often contain clauses that discourage soil exploitation.</td>
</tr>
<tr>
<td>Huffman and Fukunaga (2008)</td>
<td>probit</td>
<td>US Agricultural Economics and Land Ownership Survey, 1999</td>
<td>Contract type (binary, crop-share vs. cash-rent)</td>
<td>Regions, tenant’s farm type, other tenant’s attributes, landlord’s attributes, other factors</td>
<td>Tenant and landlord attributes that affect transaction cost and risk-sharing incentives influence contract type.</td>
</tr>
<tr>
<td>Allen and Lueck (1999)</td>
<td>logit, tobit</td>
<td>Nebraska and South Dakota, 1986; British Columbia, 1992; British Columbia, 1979; Louisiana, 1992</td>
<td>Contract type (binary, crop-share vs. cash-rent), farmer’s share of output</td>
<td>Farm, tenant, and landowner attributes, futures market</td>
<td>Factors other than risk-sharing are more important in shaping farmland rental contracts.</td>
</tr>
</tbody>
</table>
Chapter 3. Economic Theory and Hypotheses

In this chapter I develop the hypotheses that underline two key variables under examination: kinship between landowner and tenant, and residence of landowner on the rented land. Using diagrams and algebra, I deduct expected signs of these variables.

3.1 Kinship and Social Capital

My first hypothesis is that contract stipulation is less likely between landlord and tenant who are related. Social capital at the broadest sense is the connectedness among individuals, in this context personal relationships are considered an asset (Knowler and Bradshaw 2007). As a form of social capital, I assume that instead of maximizing their own benefits, family members act as if they are one household and maximize the total welfare of the household. Take tillage for example, when the tenant adopts conventional tillage, the landowner suffers from soil erosion and depletion. This is an externality that the tenant would not internalize, when the landowner is not a family member. However, if the tenant and the landowner are related, the tenant tends to care for the landowner’s interest, and demonstrates a stronger incentive to internalize the externality (Swinton 2000). Based on Warriner and Moul’s (1992) finding that kinship improves the adoption of conservation practices, it is less necessary to stipulate a tenant to take good care of land rented from a relative.

Figure 2 demonstrates this narrative, using tillage intensity as an example. When the landlord and the tenant are unrelated (left), although the landlord carries the externality cost $MC_l$ incurred by excessive tillage, the tenant only considers his own marginal cost $MC_t$. To maximize his own profit, the tenant tills at the level of $X$, which is higher than the optimal amount $X^*$. To reduce soil erosion and protect his own benefits, the landlord is incentivised to stipulate less tillage. When the landlord and the tenant are related (right), the tenant internalizes the externality cost as if the tenant and the landlord are one household. The tenant takes into consideration the landlord’s
externality cost, and the tenant’s marginal cost shifts up to $MC'$. Initiatively, the tenant operates at the optimum $X^*$, and there is no need for landlord’s stipulation.

**Figure 2. Externality and the Kinship between Landlord and Tenant**

![Graph showingExternality and the Kinship between Landlord and Tenant](image)

3.2 On-farm Landowner and Externality

The second hypothesis to be tested is whether presence of the landowner affects contract stipulation. In the case of an on-farm landowner, he/she will be directly affected by the environmental effects of the tenant’s production practices. Examples of these effects include odour from manure application, water pollution from fertilizer application, and health hazards from herbicide application. These effects are externalities that the tenant’s farming practices directly have on the landowner’s utility. Since only two parties are involved in this externality, a solution can be produced by negotiation, or Coasian bargaining (Coase 1960). Although the tenant has little incentive to internalize the externality cost, the landowner has the right to prevent harmful effects on his land. So it is in the landowner’s interest to negotiate a clause that internalizes the externality, when he/she takes residence on the farm. On the contrary, an off-farm landowner may not be
directly affected by the production practices and the lack of externality weakens the incentive to impose a stipulation clause. However, in the case where internalizing the externality helps secure the contract for the next period, the tenant would likely be incentivised.

To articulate the theoretical relationship between production externality and presence of contract stipulation, I demonstrate in Figure 3 an example where excessive application of manure causes odor problems. When the landowner lives off the farm (left), he/she is not affected by the bad smells and there is no externality. Despite the odor problem, the tenant uses as much manure (X) as required to achieve maximum profit, where the Value of Marginal Product (MVP) equals the Marginal Private Cost (MPC). When the landowner lives on the farm (right), there is externality cost associated with the tenant’s manure application. Without internalizing the externality cost, the tenant still uses X amount of manure to maximize his profit. This production decision negatively affects the landowner’s utility by causing odors with overapplication of manure. Considering the Marginal Externality Cost (MEC) carried by the landowner, the Marginal Social Cost (MSC) of applying manure becomes MEC plus MPC. The landowner is incentivized to have a contract stipulation that limits the manure amount to the optimum, X’, where MVP equals MSC.
To illustrate the same example in a Pareto optimum perspective, I use algebra to compare solutions to the scenarios with and without landlord’s presence on the farm. In the off-farm landlord scenario, the tenant maximizes his/her profit:

$$\text{Max } \pi = pf(x) - wx,$$

where $\pi$ is profit;

$p$ is the price of the agricultural product;

$x$ is the amount of fertilizer use;

$f(x)$ is the agricultural output;

and $w$ is the input price of fertilizer.

The first-order condition of the maximization problem is:

$$pf'(x) = w$$

When the landlord is present, for the first best scenario of both parties to happen, the tenant needs to maximize the social welfare of his profit and the landowner’s utility:
Max SW = pf(x) - wx + U(x),

where SW is social welfare;
p is the price of the agricultural product;
x is the amount of fertilizer use;
f(x) is the agricultural output;
w is the input price of fertilizer;
and U(x) is the utility level of the landowner, given the amount of fertilizer use.

To solve the maximization problem, first-order condition needs to be developed:

\[ pf'(x) = w - U'(x) \]

By comparing the first-order conditions of the two scenarios, I determine the direction of x to achieve the Pareto optimum in the presence of landlord. Since fertilizer use has a negative externality on the landowner, U’(x) < 0. Therefore pf’(x) in the off-farm solution is smaller than required for the Pareto optimum. Less fertilizer should be applied, and a contract stipulation is an option to achieve this goal.

However, a counter-argument may be held that, an on-farm landowner tends to get more involved in the farming operation and provides less incentive to conserve in the contract (Allen and Lueck 1993; 1999). Because the landowner is located on the farm, he/she has lower monitoring cost and can easily intervene with the tenant if an adjustment of practices is in need. Therefore on-farm landowners have less necessity to incorporate the stipulation into the contract. The conflicting theories regarding landowner’s residence on the farm demonstrate the need for an empirical analysis of this variable.
Chapter 4. Methods and Data

4.1 Survey Summary

The data used for empirical analysis were collected in Southwestern Ontario and Manitoba in April 2013. Figures 4.a and 4.b show the census divisions in the two provinces, with the surveyed areas highlighted in red. The survey was conducted by the survey company Ipsos-Reid. A random sample of 1778 farmers was contacted by phone interviews, while 847 of them agreed to take the survey and 810 completed the entire survey. The response rate was 45.5 percent. The surveys were randomly sent out to farmers in a database compiled at trade shows over years. Therefore, as Nadella (2013) suggested, the database might be skewed towards larger scale farmers who attend trade shows on a regular base.

The survey consists of three sections. Section 1 asks general information about the farmer and their farm operation. Respondents below 18 years old or out of the study region were screened out. Section 2 focuses on information on the largest rented parcel. Questions cover farmer-landowner relationship, production practices, and land characteristics. In Section 3, respondents were asked about the largest property that they own. Similarly, production practices and land characteristics were covered. Respondents were also asked whether they think farmers generally take better care of their own land than rented land. This survey took 20 minutes to complete on average. Respondents received 20 dollars for their time, if they were interested.
Figure 4a. Map of Ontario Census Regions and Divisions (Study Region Highlighted)

Source: Nadella (2013)
Figure 4b. Map of Manitoba Census Regions and Divisions (Study Region Highlighted)

Source: Nadella (2013)
4.2 Data Summary

As described in the last section, 810 farmers completed the survey, 441 of them rented land from others. Because this study focuses on contract stipulation of farmland, only these farmers who have rental contracts are used. The data section presents the five categories of BMPs identified by the survey, and highlights landowner’s stipulation by different contract and landowner type. Respondents’ opinions on whether farmers in general take better care of own land than rented land are also illustrated.

In the survey the stipulations are identified by five different farming practices, namely tillage, crop selection, drainage, fertilizer/manure, and herbicide. If a respondent answered yes to at least one of the five questions, this observation is considered as having stipulation in the general stipulation variable. In total, 17.3% of rental contracts have stipulation clauses on at least one farming practice. As illustrated in Figure 5, tillage takes up the highest percentage of the stipulations (27%), drainage the second (22%), and the remaining three practices account for approximately the same proportion.

In Table 2, I compare the means of different variables between contracts with and without stipulation. As illustrated by Table 2a, farmers under stipulation have an average of 8.86 years of rental history with the same landowner, while farmers without stipulation have an average of 13.18 years. A t-test was used to compare the difference between the means, and found that tenants under stipulation have a significantly shorter rental history with the stipulating landlord (t=3.63). Similarly in Table 2b, contracts with stipulation govern on average 321.87 acres of land, while contracts without stipulation govern on average 202.29 acres. The t-value of -3.66 suggests that contracts without stipulation govern significantly less acreage than their counterparts. According to Table 2c, the mean age of tenants who receive stipulation from their landlords is 54.45, and the
mean age of tenants who receive no stipulation is 55.95. The t-test suggests no significant difference in the mean age of these two groups (t=1.22). As demonstrated in Table 2d, 56 percent of farmland operated by tenants under stipulation is rented, and the percentage for tenants without stipulation is 62 percent. Based on the t-test, tenants without stipulation have a significantly larger proportion of rented land in their total farming acreage (t=1.83).

**Figure 5. Percentage of Rental Contracts with Stipulation Provisions Concerning Specific Production Practices**

![Pie chart showing production practices]

<table>
<thead>
<tr>
<th>Table 2a. Mean Rental History between Landowner and Tenant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (years)</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Combined</td>
</tr>
<tr>
<td>Stipulation</td>
</tr>
<tr>
<td>No stipulation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2b. Mean Plot Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (acres)</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Combined</td>
</tr>
<tr>
<td>Stipulation</td>
</tr>
<tr>
<td>No stipulation</td>
</tr>
</tbody>
</table>
Table 2c. Mean Age of Tenant

<table>
<thead>
<tr>
<th></th>
<th>Mean (years)</th>
<th>Std. dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined</td>
<td>55.69</td>
<td>9.74</td>
<td>22</td>
<td>87</td>
</tr>
<tr>
<td>Stipulation</td>
<td>54.45</td>
<td>8.67</td>
<td>34</td>
<td>72</td>
</tr>
<tr>
<td>No stipulation</td>
<td>55.95</td>
<td>9.93</td>
<td>22</td>
<td>87</td>
</tr>
</tbody>
</table>

Table 2d. Mean Share of Owned Land out of Operated Acreage

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined</td>
<td>.61</td>
<td>.25</td>
<td>0</td>
<td>.99</td>
</tr>
<tr>
<td>Stipulation</td>
<td>.56</td>
<td>.23</td>
<td>0</td>
<td>.99</td>
</tr>
<tr>
<td>No stipulation</td>
<td>.62</td>
<td>.25</td>
<td>0</td>
<td>.98</td>
</tr>
</tbody>
</table>

In Figure 6, I compare the count of contracts in landowner categories as well as the count of stipulations from each category of landowner. Out of the 441 landowners, 161 of them are non-farming investors. One-hundred-and-thirty-five landowners are friends or acquaintances with the tenant, compared to 55 that are related with the tenant. Retired farmers, active farmers and spouse of deceased farmers together have 152 observations. There are merely 2 government landowners and 1 company landowner. Most of the stipulations are from friends, acquaintances, and non-farming investors (24 and 23 respectively). Retired farmers and active farmers both have approximately 10 cases with stipulations. Spouses of deceased farmers only have 3 stipulations. Seven landowners who are family members with tenants impose stipulations. There are few observations in the categories of company and government, so information on the stipulation on these two types of landowners is limited.

According to the dataset, above 60% of the rental contracts are oral, and less than 40% are written contracts. Figure 7 makes a comparison of stipulation form among the different categories of stipulation. Across categories, tillage has the highest proportion of written stipulation (80%), and crop selection has the highest proportion of oral stipulation (48%). For crop selection, drainage, and fertilizer/manure, written contracts account for over half of the stipulations. Regarding stipulation in general, 65 percent of the stipulations are present in written contracts.
Figure 6. Contracts and Stipulations by Landowner Category

Notes: Family and Friend/Acquaintance are responses to two separate questions, while all other categories are responses to one question and add up to 100%.

Figure 7. Oral and Written Contracts across Stipulation Categories

The survey asks respondents whether they think some farmers use more fertilizer or manure on the land they own than the comparable land that they rent. Figure 8 illustrates the number of
respondents that support or do not support this belief. There are in total 404 valid observations for this question, leaving out the valid skips and “don’t know”s. Above 80 percent of respondents believe that some farmers use more fertilizer/manure on their own land than rented land. This can be an indication of a general belief that farmers better protect the quality of owned land than rented land.

**Figure 8. Responses to Whether Some Farmers Use More Fertilizer or Manure on Owned Land than Rented Land**

4.3 Summary

This chapter provides a description of the survey method used to gather data from farmers in Southwestern Ontario and Manitoba. A summary of the data is also provided to depict an overview of the farmland rental contracts and stipulation clauses in this dataset.

Among the five categories of stipulations that were surveyed, tillage accounts for 27 percent of the stipulations, while drainage takes up 22 percent. Crop selection, fertilizer/manure, and herbicide each represent approximately 17 percent of the stipulations. If the category of
stipulation is omitted, then 17 percent of rental contracts in this dataset contain at least one stipulation clause regarding any of the five production practices.

Additionally, I also compare the attributes of contracts and tenants, with and without stipulation. As the data illustrate, tenant farmers who receive stipulations from the landlord have a shorter rental history with the current landlord, compared to tenants without stipulations. The difference may be due to the fact that an acquainted landlord has built trust in the relationship and has faith in the tenant’s care of the land. There is no significant difference between the age of tenants with and without stipulations. It was also found that contracts with stipulations govern significantly more acreage than those without stipulations. In terms of the share of owned land in total farming acreage, tenants under stipulation have a lower share of owned land out of total farming acres. This may indicate landowners’ tendency to have stipulations on younger and less experienced tenants.

In the sample of rental contracts, non-farming investor is the largest group of landowners, followed by friends/acquaintances, retired farmers, family members, active farmers, and widowers. Only few observations fall in the categories of company and government. When the count of stipulation is compared across stipulation categories, most of the stipulations come from non-farming investors and friends.

Above 60 percent of the rental contracts in the dataset are oral. However, 65 percent of the stipulations are in the form of a written contract. Across the five production practices, tillage shows the largest percentage of written stipulation (80%), and crop selection shows the largest percentage of oral stipulation (40%).
Chapter 5. Empirical Model

In this chapter I outline the empirical model used for the data analysis, as well as the interaction terms and sensitivity analyses. I also provide a summary of the variables included in the analysis and the expected sign of each variable.

5.1 Model Specification

In order to evaluate the effect of different variables that influence the presence of a stipulation clause in the farmland rental contract, I use a probit model. The derivation of the empirical model is based on Wooldridge (2002).

The probit model assumes that while we only observe the presence and absence of the stipulation clause, there is a latent, unobserved continuous variable $STIP^*$ that determines the value of $STIP$.

The underlying latent model is as follows:

$$STIP_i^* = X\beta + \varepsilon_i$$

where

- $STIP_i$ is the observed stipulation decision (1 for stipulation, 0 otherwise) in the ith contract;
- $STIP_i^*$ is the latent dependent variable;
- $X$ is the vector of explanatory variables;
- $\beta$ is the vector of coefficients associated with $X$;
- $\varepsilon_i$ is the error term.

For this specific analysis, the probit model is constructed as follows:

$$STIP_i = \begin{cases} 1, & STIP_i^* > 0 \\ 0, & STIP_i^* \leq 0 \end{cases}$$

(1)

(2)
\[ P(\text{STIP} = 1|X) = \Phi(\alpha_0 + \alpha_1 \text{FAM} + \alpha_2 \text{HOME} + \text{TENANT}'\alpha_3 + \text{OWNER}'\alpha_4 + \text{LAND}'\alpha_5 + \text{CONTRACT}'\alpha_6) \]  

where

\[ P(\text{STIP} = 1|X) \] is the probability that a stipulation clause is present in the rental contract;

STIP equals 1 when a stipulation provision is included in the contract and 0 otherwise;

\[ X \] is a vector of explanatory variables included in the analysis;

\[ \Phi \] is a standard normal cumulative distribution function;

\[ \text{FAM} \] is the binary variable that represents whether the landlord and tenant are family members;

\[ \text{HOME} \] is the binary variable that represents whether the landlord resides on the rented land;

\[ \text{TENANT} \] represents a vector of tenant attributes;

\[ \text{OWNER} \] represents a vector of landowner attributes, apart from \( \text{FAM} \) and \( \text{HOME} \);

\[ \text{LAND} \] represents a vector of land attributes;

and \( \text{CONTRACT} \) represents a vector of contract attributes.

The cumulative distribution function \( \Phi \) takes the form

\[ \Phi(z) = \int_{-\infty}^{z} \phi(v) \, dv \]  

where \( \phi(v) \) is the standard normal density \( \phi(z) = \left(\frac{1}{\sqrt{2\pi}}\right) e^{-\frac{z^2}{2}} \).

Marginal effects were calculated at the mean value. Because continuous variables and dummy variables are included in the analysis, I am interested in the interpretation of marginal effects of both variables. For continuous variables, the marginal effect of \( x_i \) is

\[ \frac{\partial P(\text{STIP}=1|X)}{\partial x_i} = \phi(x_i)\alpha_i, \quad \text{where} \quad \phi(z) = \frac{d}{dz} (z) \]  

The marginal effects were calculated by the STATA command “dprobit”.

---

\(^4\) The marginal effects were calculated by the STATA command “dprobit”.

33
The marginal effect can be interpreted as the change in the probability of stipulation due to a unit change in the independent variable $x_i$, holding constant all other independent variables at their mean values. For dummy variables, the marginal effect of $x_j$ was calculated as

$$\Phi(\alpha_0 + \alpha_1 x_2 + \cdots + \alpha_{j-2} x_{j-1} + \alpha_{j-1} x_j + \cdots + \alpha_{k-1} x_k) - \Phi(\alpha_0 + \alpha_1 x_2 + \cdots + \alpha_{j-2} x_{j-1} + \alpha_j x_j + \cdots + \alpha_{k-1} x_k)$$

(6)

This effect can be interpreted as the change in the probability of stipulation due to a change from 1 to 0 in $x_j$, holding all other independent variables constant. For example, if $x_j$ is family relation between the landlord and the tenant farmer, the marginal effect is the difference in the probability of stipulation between a landlord that is related to the tenant and one that is not, holding all other factors the same.

5.2 Interaction Terms

As I discussed in Chapter 3, theoretically stipulation is less likely between tenants and landlords who are family members. In the meantime, presence of the landlord on the rented land can have effects on the stipulation in two directions: on-farm landlords may be more incentivised to stipulate, or they may prefer direct intervention to negotiating a stipulation clause. Possibly, these two variables can have non-additive effects on the stipulation decision, and an interaction term is necessary to capture this effect. As both variables are binary, Table 3 demonstrates the interaction between the two factors in a 2 by 2 table of means. The home variable appears to have a positive effect on stipulation, since on-farm landlords have higher probabilities of stipulation in both columns. The family variable appears to have a negative effect, as not-related landlords have higher probabilities in both rows than related landlords. In order to capture the potential conflicting effects of these two variables, an interaction term hom*fam is included. Based on the p-value of
this interaction term, and the robustness of results, a choice is made to keep or drop the interaction term.

<table>
<thead>
<tr>
<th>Home</th>
<th>Family</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not related</td>
<td>Related</td>
</tr>
<tr>
<td>Off-farm</td>
<td>.18</td>
<td>.08</td>
</tr>
<tr>
<td>On-farm</td>
<td>.21</td>
<td>.12</td>
</tr>
</tbody>
</table>

5.3 Sensitivity Analyses

In areas with high urbanization pressure, it is possible that landlords (especially non-farming investors and developers) place higher value in the development potential of the land than the agricultural purpose. Anecdotally, high opportunity cost of keeping farmland in agriculture drives development of farmland into commercial and residential purposes. It would be interesting to explore, under high urbanization pressure, whether landlords stipulate practices that diminish the farmland quality, to get away with regulations that protect farmland from converting to other purposes. With limited data, I only test whether urbanization pressure increases the probability of stipulation at the Ontario county level. As a proxy of urbanization pressure, I use population density to test for the effect of opportunity cost on stipulation. Contract type is also respectively added to the base model to test its robustness. Finally, I add the province that the contracts are located in to test whether there is a difference in stipulation between Ontario and Manitoba.

5.4 Variable Summary

In Table 4 I provide a list of all the variables that are included in the analysis and I explain how I expect the variables to affect the presence of stipulation. The binary dependent variable $stip$ stands for the stipulation decision, with respect to all five categories of production practices. If any one
of the practices is stipulated, the general \textit{stip} variable is equal to 1. I also include specific dependent variables for each practice.

There are four categories of key factors in my analysis: tenant attributes, landowner attributes, land attributes, and contract attributes. As explained in Chapter 3, the \textit{fam} variable depicts the kinship between the landlord and the tenant. I expect tenants to take better care of the land owned by a family member, and they are expected to do so without stipulation from landlords. The \textit{home} variable represents whether the landlord uses the land as a place of residence. This variable is expected to have a mixed effect on stipulation. The positive effect comes from the landlord’s incentive to eliminate externalities that he experiences on the farm. While the negative effect arises from the landlord’s preference to directly intervene, rather than place restrictions in advance. \textit{R\_length} represents how many years the tenant has been renting from the landlord. It is a proxy of tenure security, as information on the length of current contracts is unavailable. I expect the longer history the two parties have been doing business, the less likely a stipulation is in place, as patterns and trust have been established. I also expect that non-farming investors (\textit{non\_farmer}) stipulate less, as they know less about farming and production practices. The variables \textit{coarse} and \textit{medium} depict the soil texture, leaving out the category of fine soil to avoid the dummy variable trap. Similarly, \textit{hilly} and \textit{flat} represent the topography of farmland, leaving out gently rolling. I expect the effects of these two land characteristics to vary across production practices, so I put question marks under the expected sign. \textit{Productivity} of the land is expected to increase the likelihood of stipulation, as stipulation is more worthwhile on land of higher quality. \textit{Plot size} is expected to have a positive sign, because of economy of scale. When there are \textit{livestock} on the farm, it is expected that the landlords want the manure to stay on the land and stipulation is more likely to happen. Being adjacent to wetlands, rivers and streams is expected to raise the likelihood
of stipulation, because it increases the risk of water contamination. I also expect tenants who have higher education level to be more acceptable about stipulation clauses, which in general conserve farmland quality. Tenant’s age was included in the analysis, without an expected direction of the sign.

Other than the key variables in the base model, I also included some other variables in analyses regarding each practice, as well as in the sensitivity analysis. Tenants’ production practices on owned land are included in the analyses of stipulation regarding corresponding practices. If the tenant has the planting or drilling equipment for no-till or conservation tillage on his own land, it is likely that he will use the equipment on rented land, and stipulation is less necessary in this case. On the contrary, if the tenant applies manure on his own land, the landlord may be worried that all the manure is used on tenant’s own land, hence stipulate manure application on the rented land. I have no expectation of how tenant’s adoption of drainage on own land influences stipulation. For Ontario farmers, I expect stipulation to happen more frequently where the county level population density is high. However, the same data are not available for Manitoba. The cash variable depicts the payment type of the rental agreement, where it equals 1 if the contract is cash-rent, 0 if the contract is crop or cost share. The variable prov indicates the province that the tenant is located in, as prov equals 1 when the tenant lives in Ontario and 0 when the tenant lives in Manitoba. I have no expected signs of cash and prov, as they are added to test the robustness of the base model.
### Table 4. Variable Summary and Expected Signs

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Meaning</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
<th>Expected sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>stip</td>
<td>Whether this contract has specific provisions regarding any of the five production practices</td>
<td>441</td>
<td>0.1746</td>
<td>0.3801</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>stip_f</td>
<td>Whether this contract has specific provisions regarding fertilizer or manure applications</td>
<td>441</td>
<td>0.0522</td>
<td>0.2226</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>stip_c</td>
<td>Whether this contract has specific provisions regarding crop selection</td>
<td>441</td>
<td>0.0567</td>
<td>0.2315</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>stip_d</td>
<td>Whether this contract has specific provisions regarding surface or tile drainage</td>
<td>441</td>
<td>0.0703</td>
<td>0.2559</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>stip_h</td>
<td>Whether this contract has specific provisions regarding any of the five production practices</td>
<td>441</td>
<td>0.0544</td>
<td>0.2271</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>stip_t</td>
<td>Whether this contract has specific provisions regarding tillage practices</td>
<td>441</td>
<td>0.0884</td>
<td>0.2842</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>fam</td>
<td>Whether the landlord is a member of the tenant’s immediate or extended family</td>
<td>441</td>
<td>0.2132</td>
<td>0.4100</td>
<td>0</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>home</td>
<td>Whether the landlord used the land as a place of residence</td>
<td>441</td>
<td>0.5079</td>
<td>0.5005</td>
<td>0</td>
<td>1</td>
<td>+/-</td>
</tr>
<tr>
<td>r_length</td>
<td>How long has the tenant been renting this land from this landlord</td>
<td>440</td>
<td>12.4318</td>
<td>9.5807</td>
<td>1</td>
<td>53</td>
<td>-</td>
</tr>
<tr>
<td>non_farmer</td>
<td>Whether the landlord is characterized as Non-Farmer who is primarily holding the land as an investment opportunity</td>
<td>441</td>
<td>0.3424</td>
<td>0.4751</td>
<td>0</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>coarse</td>
<td>Equals 1 if soil texture is characterized as coarse (Sandy, Sandy loam), 0 otherwise</td>
<td>441</td>
<td>0.2358</td>
<td>0.425</td>
<td>0</td>
<td>1</td>
<td>?</td>
</tr>
<tr>
<td>medium</td>
<td>Equals 1 if soil texture is characterized as medium fine (Silty loam, Loam), 0 otherwise</td>
<td>441</td>
<td>0.1247</td>
<td>0.3308</td>
<td>0</td>
<td>1</td>
<td>?</td>
</tr>
<tr>
<td>hilly</td>
<td>Equals 1 if topography is characterized as hilly, 0 otherwise</td>
<td>441</td>
<td>0.0748</td>
<td>0.2634</td>
<td>0</td>
<td>1</td>
<td>?</td>
</tr>
<tr>
<td>flat</td>
<td>Equals 1 if topography is characterized as flat, 0 otherwise</td>
<td>441</td>
<td>0.4898</td>
<td>0.5005</td>
<td>0</td>
<td>1</td>
<td>?</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
<td>n</td>
<td>Mean</td>
<td>Std dev</td>
<td>Min</td>
<td>Max</td>
<td>Value</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----</td>
<td>----------</td>
<td>----------</td>
<td>-----</td>
<td>-----</td>
<td>--------</td>
</tr>
<tr>
<td>productivity</td>
<td>Compared to other land in the area, quality of the land is considered to be 1 if it is excellent, very good, or good; 0 if it is poor or very poor.</td>
<td>441</td>
<td>0.9025</td>
<td>0.2970</td>
<td>0</td>
<td>1</td>
<td>+</td>
</tr>
<tr>
<td>plot_size</td>
<td>Farmable acres of this land</td>
<td>438</td>
<td>223.3128</td>
<td>263.8682</td>
<td>4</td>
<td>3000</td>
<td>+</td>
</tr>
<tr>
<td>livestock</td>
<td>Whether there is livestock raised on the farm</td>
<td>441</td>
<td>0.5215</td>
<td>0.5001</td>
<td>0</td>
<td>1</td>
<td>+</td>
</tr>
<tr>
<td>wetland</td>
<td>Whether the land is adjacent to wetlands, rivers or streams</td>
<td>441</td>
<td>0.5624</td>
<td>0.4967</td>
<td>0</td>
<td>1</td>
<td>+</td>
</tr>
<tr>
<td>educ</td>
<td>Tenant’s education level. Equals 1 if the education level is above some college, 0 if the education level is completion of high school or below</td>
<td>441</td>
<td>0.5556</td>
<td>0.4975</td>
<td>0</td>
<td>1</td>
<td>+</td>
</tr>
<tr>
<td>age</td>
<td>Tenant’s age</td>
<td>440</td>
<td>55.6864</td>
<td>9.7355</td>
<td>22</td>
<td>87</td>
<td>?</td>
</tr>
<tr>
<td>o_till</td>
<td>Equals 1 if no-till, minimum tillage or conservation tillage was adopted on tenant’s own land; equals 0 if conventional tillage was adopted on tenant’s own land</td>
<td>418</td>
<td>0.6435</td>
<td>0.4795</td>
<td>0</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>o_drain</td>
<td>Equals 1 if tenant’s own land was surface or tile drained; 0 otherwise</td>
<td>420</td>
<td>0.6738</td>
<td>0.4694</td>
<td>0</td>
<td>1</td>
<td>?</td>
</tr>
<tr>
<td>o_manure</td>
<td>Equals 1 if manure was applied on tenant’s own land; 0 otherwise</td>
<td>421</td>
<td>0.4157</td>
<td>0.4934</td>
<td>0</td>
<td>1</td>
<td>+</td>
</tr>
<tr>
<td>pdensity</td>
<td>Population density (ppl/acre)</td>
<td>209</td>
<td>100.3943</td>
<td>151.1903</td>
<td>16.2</td>
<td>1040</td>
<td>+</td>
</tr>
<tr>
<td>cash</td>
<td>Equals 1 if the rental agreement is cash rent, 0 if it is crop or cost share</td>
<td>441</td>
<td>0.8503</td>
<td>0.3571</td>
<td>0</td>
<td>1</td>
<td>?</td>
</tr>
<tr>
<td>prov</td>
<td>Equals 1 if the tenant is located in Ontario, 0 if the tenant is located in Manitoba</td>
<td>441</td>
<td>0.5329</td>
<td>0.4995</td>
<td>0</td>
<td>1</td>
<td>?</td>
</tr>
</tbody>
</table>
Chapter 6 Results and Discussion

6.1 Results

My analysis resulted in mixed evidence for the two major hypotheses on family relations and presence of landlord. Table 5 presents the marginal effects of each variable from the base model, regarding any one of the five surveyed practices. In Chapter 3, I hypothesized that stipulation is less likely between family members, because a tenant would take better care of the land if it belongs to a family member. The empirical result is consistent with this hypothesis. The fam variable is negative and statistically significant at the 0.05 significance level. On average, a landlord has 9 percent less of probability to impose a stipulation if the tenant is a relative. In chapter 3 I also described conflicting expectations regarding the sign of the home variable. One argument is that if the landlord lives on the farm, he or she would be exposed to externalities caused by the farming activities and, subsequently, would be motivated to have restrictions on the practices that affect his utility. The other argument is that when the landlords are present on the farm, they could more easily intervene whenever necessary and, hence, do not need a stipulation in the contract. In this analysis, as identified in Table 5, the home variable is statistically insignificant at the 0.10 significance level.

In addition to family relation, some other tenant and land characteristics were also found to be important in influencing stipulations. The length of time that the tenant has been renting from the landlord appears to be an important factor that influences stipulations (α=0.01). By increasing rental length by 1 year, the probability of stipulation decreases by 0.8 percent. The tenant’s education level appears to have a positive effect at the 0.05 significance level. Stipulations are 9 percent more likely if the tenants have at least some college education. Topography of land also has a significant effect (α=0.10), as the probability of stipulation increases by 14 percent on hilly
land. Plot size positively affects stipulation decisions, at the 0.01 significance level. However the probability of stipulation merely increases by 0.02 percent given 1 acre increase in plot size.

### Table 5. Probit Results for the Base Model Regarding Any Stipulation

|                | Marginal effect (dF/dx) | Std. Error | Z       | P>|z|   | x-bar | 95% Confidential Interval |
|----------------|------------------------|------------|---------|-------|-------|---------------------------|
| fam            | -0.0881                | 0.0365     | -2.04   | 0.041 | 0.2156 | -0.1596 -0.0166           |
| home           | 0.0361                 | 0.0356     | 1.01    | 0.313 | 0.5092 | -0.0336 0.1058           |
| r_length       | -0.0078                | 0.0022     | -3.46   | 0.001 | 12.4725| -0.0120 -0.0036           |
| non_farmer     | -0.0015                | 0.0389     | -0.04   | 0.970 | 0.3417 | -0.0777 0.0748           |
| coarse         | -0.0315                | 0.0405     | -0.74   | 0.457 | 0.2339 | -0.1108 0.0479           |
| medium         | 0.0282                 | 0.0555     | 0.53    | 0.596 | 0.1261 | -0.0806 0.1369           |
| hilly          | 0.1421                 | 0.0916     | 1.82    | 0.069 | 0.0734 | -0.0374 0.3217           |
| flat           | 0.0089                 | 0.0371     | 0.24    | 0.810 | 0.4908 | -0.0637 0.0815           |
| productivity   | 0.0130                 | 0.5710     | 0.22    | 0.824 | 0.9014 | -0.0989 0.1250           |
| plot_size      | 0.0002                 | 0.0001     | 3.28    | 0.001 | 223.374| 0.0001 0.0003           |
| livestock      | 0.0214                 | 0.0356     | 0.60    | 0.548 | 0.5229 | -0.0483 0.0911           |
| wetland        | -0.0433                | 0.0370     | -1.18   | 0.238 | 0.5619 | -0.1159 0.0293           |
| educ           | 0.0901                 | 0.0343     | 2.55    | 0.011 | 0.5573 | 0.0228 0.1574            |
| age            | 0.0001                 | 0.0019     | 0.05    | 0.957 | 55.6995| -0.0036 0.0038           |

Log likelihood = -179.3234
Pseudo R² = 0.1110  
N = 436  
obs. P = 0.1743  
pred. p = 0.1437 (at x-bar)

In Table 6, I compare the marginal effects under each practice. As the analysis of fertilizer and manure application produced no significant results, only crop selection, drainage, herbicide, and tillage are reported. Family relation is only significant in tillage stipulation, at the 0.05 significance level. Rental length is still negatively significant except for drainage (α=0.05 for crop selection and tillage, α=0.10 for herbicide), but with smaller marginal effects than the base model. The hilly variable for drainage is dropped as it perfectly predicts failure, while stipulation on drainage is 11 percent more likely on medium-fine soil than on fine soil (α=0.05). Topography is only significant for herbicide stipulations at the 0.10 significance level, as stipulation is 9 percent more likely on hilly land. Plot size is a positively significant influencing factor for drainage and tillage stipulations (α=0.01), with a small marginal effect. Education appears to be significant only
regarding tillage stipulation ($\alpha = 0.10$), and stipulations are 4 percent more likely if the tenant attained some college education. Tenants’ practices on their owned land were also included in the analyses of crop selection and tillage stipulations, but found to be insignificant at the 0.10 significance level. As the information on tenants’ herbicide practice on owned land is unavailable, and adding tenants’ use of cover crop on owned land drastically reduces the number of observations, these two variables are not included.

Table 7 compares the base model results with the sensitivity analyses. When the interaction term between family relation and landlord’s presence is included, all the significant variables remain significant, but the interaction term appears insignificant at the 0.10 significance level. When population density is included in the analysis of Ontario samples, the sample size is reduced by half. Family relation, topography, plot size, and education lose their significance, while rental length remain significant at the 0.05 significance level. At the 0.10 significance level, soil texture becomes significant, while population density appear to be insignificant. In the sensitivity analysis of contract type, cash appears insignificant ($\alpha = 0.10$), while all significant variables in the base model maintain their status. The sensitivity analysis of province demonstrates that, Ontario tenants are less likely to receive stipulations at the 0.05 significance level, while all significant variables in the base model remain significant.
Table 6. Probit Results for Stipulation Regarding Specific Practices (Marginal Effects)

<table>
<thead>
<tr>
<th>dF/dx</th>
<th>Crop selection</th>
<th>Drainage</th>
<th>Herbicide</th>
<th>Tillage</th>
</tr>
</thead>
<tbody>
<tr>
<td>fam</td>
<td>-0.0341</td>
<td>-0.0482</td>
<td>-0.0307</td>
<td>-0.0589**</td>
</tr>
<tr>
<td></td>
<td>(0.0167)</td>
<td>(0.0230)</td>
<td>(0.0202)</td>
<td>(0.0191)</td>
</tr>
<tr>
<td>home</td>
<td>0.0012</td>
<td>-0.0002</td>
<td>-0.0200</td>
<td>0.0117</td>
</tr>
<tr>
<td></td>
<td>(0.0179)</td>
<td>(0.0244)</td>
<td>(0.0199)</td>
<td>(0.0220)</td>
</tr>
<tr>
<td>r_length</td>
<td>-0.0036***</td>
<td>-0.0015</td>
<td>-0.0023*</td>
<td>-0.0042***</td>
</tr>
<tr>
<td></td>
<td>(0.0012)</td>
<td>(0.0013)</td>
<td>(0.0012)</td>
<td>(0.0014)</td>
</tr>
<tr>
<td>non_farmer</td>
<td>-0.0039</td>
<td>-0.0071</td>
<td>0.0226</td>
<td>0.0087</td>
</tr>
<tr>
<td></td>
<td>(0.0192)</td>
<td>(0.0257)</td>
<td>(0.0236)</td>
<td>(0.0250)</td>
</tr>
<tr>
<td>coarse</td>
<td>0.0242</td>
<td>0.0453</td>
<td>0.0166</td>
<td>-0.0203</td>
</tr>
<tr>
<td></td>
<td>(0.0261)</td>
<td>(0.0376)</td>
<td>(0.0263)</td>
<td>(0.0232)</td>
</tr>
<tr>
<td>medium</td>
<td>0.0261</td>
<td>0.1111**</td>
<td>-0.0078</td>
<td>-0.0061</td>
</tr>
<tr>
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<td>(0.0350)</td>
<td>(0.0600)</td>
<td>(0.0283)</td>
<td>(0.0317)</td>
</tr>
<tr>
<td>hilly</td>
<td>-0.0258</td>
<td>-0.0001</td>
<td>0.0937*</td>
<td>-0.0191</td>
</tr>
<tr>
<td></td>
<td>(0.0206)</td>
<td>(0.0727)</td>
<td>(0.0349)</td>
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<tr>
<td>flat</td>
<td>-0.0133</td>
<td>-0.0006</td>
<td>0.0095</td>
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<td>(0.0183)</td>
<td>(0.0244)</td>
<td>(0.0211)</td>
<td>(0.0231)</td>
</tr>
<tr>
<td>productivity</td>
<td>-0.0020</td>
<td>0.0403</td>
<td>0.0149</td>
<td>-0.0443</td>
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<tr>
<td></td>
<td>(0.0291)</td>
<td>(0.0384)</td>
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<tr>
<td>plot_size</td>
<td>0.0000</td>
<td>0.0001**</td>
<td>0.0000</td>
<td>0.00002***</td>
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<td>(0.0000)</td>
<td>(0.0000)</td>
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<tr>
<td>wetland</td>
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<td>-0.0019</td>
<td>-0.0080</td>
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<td>(0.0181)</td>
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<tr>
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<td>0.0205</td>
<td>0.0247</td>
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<td>(0.0180)</td>
<td>(0.0242)</td>
<td>(0.0191)</td>
<td>(0.0221)</td>
</tr>
<tr>
<td>age</td>
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<td>0.0019</td>
<td>0.0001</td>
<td>-0.0006</td>
</tr>
<tr>
<td></td>
<td>(0.0009)</td>
<td>(0.0013)</td>
<td>(0.0010)</td>
<td>(0.0012)</td>
</tr>
<tr>
<td>livestock</td>
<td>0.0013</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>(0.0180)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>o_drain</td>
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<td>0.0199</td>
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<td>-</td>
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<tr>
<td></td>
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<td>(0.0240)</td>
<td>-</td>
<td>-</td>
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<tr>
<td>o_till</td>
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<td>-</td>
<td>-0.0327</td>
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<tr>
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<td>(0.0270)</td>
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</table>

Log likelihood: -84.7938  -93.7948  -86.0235  -102.3755
Pseudo R²: 0.0874  0.0882  0.0742  0.1936
N: 436  385  436  414

Notes: *** denotes a p-value less than 0.01; ** denotes a p-value less than 0.05; * denotes a p-value less than 0.1.
### Table 7. Sensitivity Analyses and Comparison with the Base Model (Coefficients)

<table>
<thead>
<tr>
<th>Coefficients</th>
<th>Base Model</th>
<th>Base Model with Interaction Term</th>
<th>Base Model with Population Density</th>
<th>Base Model with Contract Type</th>
<th>Base Model with Province</th>
</tr>
</thead>
<tbody>
<tr>
<td>fam</td>
<td>-0.4473**</td>
<td>-0.5995*</td>
<td>-0.2971</td>
<td>-0.4560**</td>
<td>-0.4549**</td>
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<td>(0.2191)</td>
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<td>(0.3283)</td>
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<td>home</td>
<td>0.1596</td>
<td>0.1180</td>
<td>0.3005</td>
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<td>(0.1704)</td>
<td>(0.2501)</td>
<td>(0.1582)</td>
<td>(0.1626)</td>
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<td>r_length</td>
<td>-0.0343***</td>
<td>-0.0345***</td>
<td>-0.0340**</td>
<td>-0.0345***</td>
<td>-0.0362***</td>
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<td>(0.0099)</td>
<td>(0.0140)</td>
<td>(0.0099)</td>
<td>(0.0100)</td>
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<tr>
<td>non_farmer</td>
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<td>-0.0074</td>
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<td>(0.2852)</td>
<td>(0.1952)</td>
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<td>(0.2882)</td>
<td>(0.2247)</td>
<td>(0.2261)</td>
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<tr>
<td>hilly</td>
<td>0.5110*</td>
<td>0.5120*</td>
<td>0.3213</td>
<td>0.5165*</td>
<td>0.4917*</td>
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<td>0.3928</td>
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<td>(0.1634)</td>
<td>(0.1638)</td>
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<td>209</td>
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<td>436</td>
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</tbody>
</table>

Notes: *** denotes a p-value less than 0.01; ** denotes a p-value less than 0.05; * denotes a p-value less than 0.1.

6.2 Discussion

In the base model that considers any of the five surveyed practices, significant factors influencing stipulations are family relation, rental length, topography, plot size and education. The effect of family relation was discussed in Chapter 3. Rental length has a negative effect on the presence of a stipulation. This can be understood as the longer the tenant and the landlord have been engaged in cooperation, the more trustworthy they become of each other. The landlord is less likely to have restrictions on a tenant who has a trace record of good management on the same property, since trust has been built in the relationship. Based on the results of the base model, stipulations are more likely to happen on hilly land. Topography is more relevant to fertilizer/manure and herbicide application, since the risk of farmland runoffs rises on hilly land. Plot size increases the likelihood of stipulation, because of economy of scale. The adoption of a production practice is more economically efficient when the plot is large enough. The positive effect of the tenant’s education level can be attributed to better understanding of social responsibility and environmental awareness. When the tenants achieve higher education, they are likely more open with stipulations, especially regarding conservation practices.

When the stipulation variable is broken into specific practices, the results become less significant. Across different practices, rental length and plot size remain relatively significant, while other variables lose their significance in most models for individual practices. It is easy to understand that topography affects stipulation on herbicide application, and soil texture affects
stipulation on drainage installation. Interestingly, tenants’ practices on their owned land are found to be insignificant in tillage and drainage. This is possibly due to the limited observations with stipulation within each category of production practices.

Sensitivity analyses are conducted with an interaction term, population density, contract type and province. The interaction term between home and fam, along with population density and contract type are all found to be insignificant in the analyses. The inclusion of province in the sensitivity analysis indicates that stipulation is 38% less likely in Ontario than in Manitoba. Because population density is only available for the Ontario samples at the county level, the sample size for this analysis drops by half. This results in the loss of significance of most variables. Other than this case, the sensitivity analyses do not significantly affect my findings, indicating that the empirical results produced by the base model are robust.
Chapter 7. Follow up Study in the Lake Simcoe Watershed

7.1 Background

As the sixth largest lake in Southern Ontario, the Lake Simcoe Watershed is home to almost 400,000 people (LSRCA 2008). It provides a source of drinking water for eight municipalities and supports the living, agricultural, and recreational activities of its residents. The lake has been exposed to pollution problems, mainly phosphorus loads, since the last century. The deterioration of water quality in the Lake Simcoe Watershed not only endangers fish species, but also diminishes drinking water quality and amenity values of the watershed (LSRCA 2008). One cause of the exceptionally high phosphorus content is farmland runoffs from fertilizer application (MOE 2009). Half of the land surrounding and draining in to Lake Simcoe is farmland (MOE 2013). Agriculture, as a major industry in the Lake Simcoe region, generates 300 million dollars of annual revenue (MOE 2013). Under the Lake Simcoe Protection Plan (MOE 2009), OMAFRA has committed to reducing phosphorus loads in the Lake Simcoe Watershed. Given the fragile ecological conditions and agricultural intensity in the watershed, the conservation of farmland has become a priority in restoring the ecological health of Lake Simcoe.

Given the results from the phone interview dataset in Southern Ontario and Manitoba, I set out to follow up this study with an in-person survey in the Lake Simcoe region. First, I was interested to see if I could gain more insights into stipulations through a personal survey that probes into the specifics of stipulations. Second, I wanted to probe into a number of key questions. In particular: Would a survey with detailed stipulation questions capture a higher percentage of stipulation? What are the contents of these stipulations? Why do landlords stipulate certain production practices on the rented parcel? Do stipulations tend to appear in oral or written arrangements?
7.2 Method and Data

Seven Undergraduate Research Assistants (URAs) who have contacts in the five counties—Simcoe, Durham, Kawartha Lakes, York, and Peel—were recruited to carry out the interview. A more refined geographic definition of the Lake Simcoe watershed is presented in Figure 9. However, we allowed any participants in the counties that comprise the Lake Simcoe area to participate. This interview used the snowball sampling approach to recruit participants. A snowball sampling process enables survey participants to recruit future participants from among their acquaintances. Potential respondents consist of URAs’ private contacts and contacts identified by survey respondents. Potential participants were contacted by URAs over the phone to request participation, and if they were willing to participate in the survey, a date and a time would be arranged. The interviews were conducted in person or over the phone. The in-person interviews were conducted at either home or farm location of respondents. The interview took 15 to 30 minutes to complete on average. There were 2 rounds of interviewing. The first round happened during the Christmas break in 2014, and the second occurred over the Mid-February reading week in 2015. Upon submission of the completed surveys, the URAs had an exit interview, in order to improve the survey design, capture information missed in the survey form, and add context to the survey answers.

Each URA received training on how to conduct the survey. This training was provided on a one-on-one basis according to the following outline:

1. The URA participated themselves in the survey (which is used as a completed survey if the student was from a farm in the Lake Simcoe region, or served as a “mock” survey if the student was not from a farming background), in order to experience the survey from the participant perspective and to become familiar with the survey content.
2. Upon completion of the survey, the URA had a chance to reflect on the content, and to ask any questions or concerns about the survey itself or the interview process.

3. The URA was given a brief presentation focusing on key training points (survey execution, consent and ethics requirements, biosafety for farm visits, etc.).

4. The URA practiced surveying with the trainer.

5. Final suggestions from the trainer, and Q&A.

There are 4 sections in the survey. Section 1 seeks general information of farmers and their farm operation. Unqualified respondents under 18 years old or out of the Lake Simcoe region are filtered in this section. Section 2 focuses on rental contracts. Respondents are asked about characteristics of their contracts, and their relationship with the landowners. The most important and lengthy part of this survey is on landowner’s stipulation. Using the same five categories of production practices (tillage, crop selection, drainage, fertilizer/manure and herbicide application), respondents are asked whether one practice was stipulated by the landowner. If a stipulation is present, questions proceed to ask the specifics, like contract structure, landowner type, and land characteristics. In Section 3, respondents are asked questions about production practices adopted on their own land. Finally, Section 4 covers fertilizer use and respondents’ opinions on whether farmers generally take better care of own land than rented land.

Since the participants were not randomly drawn, this dataset cannot produce representative empirical results. Instead, we use the results to assess previous findings and identify future issues for further analysis.
Figure 9. The Lake Simcoe Watershed Defined by the Ministry of Environment

Lake Simcoe Drainage Basin

Source: MOE (2007)
7.3 Interview Results

From the two rounds of interviewing, 59 farmers were interviewed by late February 2015. The sample includes 41 contract stipulations received by 22 farmers. Among them, 18 interviews were conducted in Simcoe, 15 in York, 6 in Durham, 1 in Peel, and 1 in Kawartha Lakes. Recall in the Ontario and Manitoba survey, tenants were asked about their largest rented property, and 17 percent of the rental contracts included stipulation clauses. Comparatively, the Lake Simcoe survey participants were asked about multiple properties, and 37 percent of the farmers surveyed had stipulations from their landlords. Table 8 lists all the stipulations based on the production practices that landlords have restrictions on. Almost half of the stipulations restricted the crop to be grown on the rented land. Four landlords stipulated the use of cover crop and one landlord stipulated the use of crop rotation. In terms of fertilizer or manure application, most stipulations were regarding manure use. Two landlords required no manure application near their houses, and another two required use of manure on the land. One landlord specified that manure cannot be applied in winter. In the one contract stipulating fertilizer application, the landlord wanted some fertilizer to be applied at least once a year. There were three landlords who did not want any herbicides to be applied on their land, and one landlord who only allowed organic herbicides. Three landlords in my sample required the tenant farmer to adopt minimum tillage. And two landlords required the installation of tile drainage on rented land. One contract included a clause that disallowed any pesticide that was toxic or would persist in the soil over a long period.
Table 8. Stipulations by Production Practices

<table>
<thead>
<tr>
<th>Category</th>
<th>Selection</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop</td>
<td>Cover crop</td>
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</tr>
<tr>
<td></td>
<td>Rotation</td>
<td>1</td>
</tr>
<tr>
<td>Fertilizer/Manure</td>
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<td>3</td>
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<tr>
<td></td>
<td>Type</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Timing</td>
<td>1</td>
</tr>
<tr>
<td>Herbicide</td>
<td>Quantity</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Type</td>
<td>2</td>
</tr>
<tr>
<td>Tillage</td>
<td>Minimum tillage</td>
<td>3</td>
</tr>
<tr>
<td>Drainage</td>
<td>Tile drainage</td>
<td>2</td>
</tr>
<tr>
<td>Pesticide</td>
<td>Type</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>41</td>
</tr>
</tbody>
</table>

Figure 10 demonstrates a breakdown of the categories of landlords who hold stipulations. Non-farming investors are the largest category of landlords who have restrictions on tenant farmers’ production practices, as they take up 15 of the 41 contracts. Companies and corporations rank the second, with 12 out of 41 contracts. Eight of the stipulating landlords are retired farmers, and only two are active farmers. There are only one government and one widower of farmer who hold restrictions on tenant farmers’ practices. The top two categories of stipulating landlords reveal that 70 percent of the landlords who stipulate production practices are not directly involved in agriculture. According to Figure 11, 78 percent of the landlords who stipulate live on the farm, or within 5 km of the farm.
Figure 10. Category of Stipulating Landlords

Figure 11. Residence Location of Stipulating Landlords
During the interview, the farmers were asked why they think their landlords hold such restrictions on farming practices. Figure 12 shows the farmers’ responses to this question. Surprisingly, 25 percent of the respondents thought their landlords used stipulations to protect the potential to convert the land into development purposes. In most of the cases where crop selection was restricted, the landlords disallowed growth of hay, and the respondents identified the endangered bird bobolink as the cause of the restriction. Bobolink, a grassland bird that resides in hay field, is listed as a threatened species in Ontario. The tenants believed that by disallowing hay, the landlords managed to get away with government’s pending regulations on the land use on bobolink habitat. The tenants also believed that landlords are trying to address environmental concerns when they required organic practices or limit herbicide application near rivers. Erosion control was an important reason behind landlords’ stipulation of minimum tillage and cover crop, according to tenant respondents. While lifestyle and personal preferences rank 4th on the list, the same amount of farmers believed their landlords put restrictions to eliminate or reduce the externality caused by the tenants’ farming activities. These landlords lived on or close to the rented farmland, and they allegedly held restrictions to protect their lawns and bees from being damaged by the herbicide use, or to prevent manure odors around the house. Some tenants thought their landlords limited crop selection in the effort to deter wildlife from the property. A small portion of landlords were believed to stipulate crop rotation and fertilizer application to maintain soil health and nutrient levels. Other reasons given by the tenants include recommendation of the practice by the tenant and receiving higher rent.
Table 9 demonstrates the development versus non-development reasons behind stipulations. Development potential alone explains the motivations of 10 out of 42 stipulations, while all other 8 motivations account for 32 of the stipulations. Clearly, landlords impose stipulations on tenants’ production practices, mostly to ensure the opportunity to use the land for non-agricultural purposes.

<table>
<thead>
<tr>
<th>Stipulation purpose</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development</td>
<td>10</td>
</tr>
<tr>
<td>Other 8 motivations</td>
<td>32</td>
</tr>
</tbody>
</table>

According to Figure 13, the split between oral and written stipulations is even. As illustrated by Figure 14, the average quality of land under stipulations is good, and the distribution is approximately symmetric. Figure 15 shows that 72 percent of the land under stipulation are adjacent to wetlands, rivers, and streams.
Figure 13. Form of Stipulation

Figure 14. Land Quality under Stipulation

Oral
51%

Written
49%

Very poor
Poor
Good
Very good
Excellent
7.4 Discussion

In this section I discuss the Lake Simcoe survey results and make comparisons with the empirical findings from the Ontario and Manitoba survey. Specifically, I further investigate the stipulations driven by the bobolink issue and the landlords’ intent to internalize externalities. I also compare the empirical effects of contract type, and the non-farming investor status of landlords with the anecdotal findings in the interview. Finally, I discuss the limitation of the interview method, and explore the reason why the two surveying approaches yield different findings.

7.4.1 The Bobolink Regulation and Stipulation Motivation

Bobolink has been listed as a threatened species by the Ontario Ministry of Natural Resources and Forestry (MNRF) since 2010 (MNRF 2014a). By the definition of threatened species, bobolinks are not endangered, but will be if actions are not taken (MNRF 2014a). The grassland bird nests in hay and pasture agricultural fields (MNRF 2014b). Its breeding period commences between

![Figure 5. Proximity of Land to Wetlands, Rivers and Streams under Stipulation](image)
May and July, which coincides with hay harvesting and livestock pasturing (MNRF 2014b). As a result of the interference of agricultural activities during the breeding season, earlier maturing seed mixtures, shorter crop rotation cycles, and declining acreage of hay and pasture in Ontario, bobolinks face severe surviving challenges (MNRF 2014a; 2014b).

As per the Endangered Species Act (MNRF 2007), no person can kill, harm, or harass a species listed as threatened on the Species at Risk in Ontario List, nor can any person damage or destroy the habitat of a threatened species. However, considering the importance of the cooperation of the agricultural community on bobolink protection, agricultural operations were exempted from regulations with an expiry date of October 2014 (MNRF 2014b). In April 2014, MNRF approved a further interim exemption until December 2015, allowing the ministry to seek public input in the approval of a ten-year exemption (MNRF 2014b).

The Lake Simcoe interview had a unique timing, as the farmers were interviewed in December 2014 and February 2015, by which the farmers would have known about the second exemption but are still governed by contracts made as if the exemption ended in October 2014. Therefore my anecdotal findings to some extent mirror the actions farmers took in response to the revoke of the original exemption. This explains the dominance of stipulations in my dataset that disallow growth of hay. As the initial expiry of exemption approaches, landlords avoid hay to be grown on their rented land, in order to prevent the regulation of habitat protection. If the bobolink habitat is established and regulated, the tenants would not be able to harvest hayfields during the breeding season, nor would the landlords be able to convert the farmland into residential or commercial purposes. Given the high land values in the Lake Simcoe Watershed, opportunity cost of keeping the land in agriculture is high. As identified in the exit interviews with the URAs, a lot of landlords who took actions to the bobolink issue were developers and contractors who are only
interested in the non-agricultural use of the land. These companies and non-farming investors certainly want to avoid having their investment locked in agriculture. As the initial expiry date draws near, both tenants and landowners would have the incentive to preventatively clear hayfields so as to avoid the pending regulations.

In the case of bobolink protection, the government sets out to protect the threatened species, while its policies and regulations result in consequences that are against the social objective set forward. The incidental findings in the Lake Simcoe interview suggest the need of further investigation into the interaction in the agricultural community regarding bobolink protection. Specifically, a survey that reflects the change in farmers’ actions concerning the extended exemption would be particularly illuminating.

7.4.2 Landowners’ Intent to Eliminate Externality

In Chapter 3 I introduced two conflicting theories underlining the effect of landlord’s presence on the stipulation decision. The first theory demonstrates that, when the landlord is present, he is potentially exposed to the externality from the tenant’s farming activities, therefore the landlord has the incentive to restrict the negative effects on his utility. Although the empirical results found this variable to be insignificant, in Lake Simcoe stipulations are dominated by on-farm landlords (78%). Among the stipulations received from on-farm landlords, four specific cases were identified by the tenants as the landlords stipulate practices that protect their utility living on the farm. In one case, the landlord disallowed any herbicide applied on the land and limited the crop choice to hay only, because he thought the herbicide runoffs were killing his lawn. Two landlords specified that no manure can be applied around their houses, to prevent the odor. And one landlord disallowed any herbicide application, as he kept bees on the same property and did not want any harm to the bees from herbicide. These examples are consistent with the hypothesis, and
demonstrate that when an on-farm landlord’s utility is harmed by the tenant’s farming practices, he/she may impose a restriction on the farming activity to restore his utility level.

The second theory I mentioned in Chapter 3 is that, on-farm landlords are less likely to have a stipulation as they can intervene the farming activities whenever they feel necessary. This appears to be inconsistent with the dominance of on-farm landlords in the Lake Simcoe dataset.

7.4.3 Contract Attributes

The sensitivity analysis found the contract type to have no significant effect on stipulation. Comparatively, all the stipulations in the Lake Simcoe interview are under cash rent contracts. The inconsistency can be due to the prominence of cash rent contracts in agriculture, and not necessarily a causal relationship between contract type and stipulation.

7.4.4 Non-farming Investors

In the Lake Simcoe study, 37 percent of stipulating landlords are non-farming investors and 32 percent of them are companies. However, in the empirical analysis of the Ontario and Manitoba study, whether the landlord is a non-farming investor does not matter to the stipulation decision. As the URAs recorded, some of the farmers accused their developer landlords to be only interested in selling the land, and do not take interest in the operation and conservation on the farm. Some farmers claimed that their non-farming landlords to know nothing about farming and different production practices. The interview responses show that stipulations by non-farming investors and companies are more focused on development potential and personal lifestyles, and are not necessarily good for farmland conservation. On the other hand, these non-farming investors tend not to live on the farm and hence are typically absentee landowners. The complicated nature of individual and corporate investor landlords require further research on their management of farmland and the effect of their stipulations on farmland conservation.
Chapter 8. Summary and Policy Implications

In the final chapter, I summarize the findings from the two parts of my study, and analyze the difference between the two approaches. Policy implications and direction for future research are also discussed.

8.1 Summary of Findings from the Ontario and Manitoba Survey

The Ontario and Manitoba survey data were used to determine the effect of factors influencing stipulation decisions. In terms of general stipulation regardless of practices, family relation and the length of business relation between tenants and landlords reduce the probability of a stipulation, as the landlord trust in the tenant’s good management of the land without stipulation. Plot size increases the likelihood of stipulation because of economies of scale. Tenant’s education level also increases the probability of stipulation, probably because tenants with higher education are more open with farmland conservation. Topography influences stipulations, as erosion is more likely to be present on hilly land.

The models with respect to each production practices produced different results. Rental length and plot size are generally still significant across practices, while other variables lose their significance in most of the models. Specifically, topography is important in influencing stipulation on herbicide application, and soil texture is significant in influencing stipulation on drainage installation. Tenants’ practices on owned land were found to have no effect on stipulations.

Sensitivity analyses with contract type and the interaction between family relation and landlord’s presence did not significantly affect the findings from the base model. Population density was tested in the Ontario sample and appeared to be insignificant. These results indicate the robustness of the base model.
8.2 Summary of Findings from the Lake Simcoe Interview

The Lake Simcoe interview was conducted to further the understanding of contract stipulations. The most important finding is that, in the tenants’ opinion, their landlords first stipulate to protect the development potential of the land. Other important motivations include environmental concerns, erosion control, personal lifestyles, and elimination of externalities. It was noted that the majority of the stipulations come from non-farming investors and companies. Retired farmers and active farmers who have adequate farming knowledge and involvement in the farming community only account for a small portion of stipulating landlords.

The interview coincidentally reveals the threatened grassland bird, bobolink, as an important cause of landlords’ restrictions on growing hay. As the exemption of bobolink protection on agriculture came to expiry, landlords tried to prevent potential regulation of the land use on bobolink habitat. By disallowing growth of hay, the landlords pre-emptively removed bobolink habitat to ensure the possibility of converting the farmland into commercial and residential uses.

8.3 Comparison of Findings in the Two Surveys

These two surveys used different approaches. The Ontario and Manitoba study used random sampling and empirical analysis, while the Lake Simcoe study used snowball sampling and qualitative analysis.

As illustrated in Table 10, the two surveys produced very different findings. In the following discussion, I refer to the Ontario and Manitoba study as OM, and the Lake Simcoe study as LS. In the OM dataset, tillage is identified as the most common stipulation, while crop selection is the most common one in the LS study. From the empirical analysis of the OM data, I found no evidence that presence of landlord on the farm affects stipulation. Comparatively in the LS responses, 78 percent of landlords who stipulate live on the farm. The OM results suggest that non-
farming landlords have no effect on stipulations. However, in the LS dataset, non-farming landlords account for 37 percent of the stipulating landlords. Again, empirical results from the OM data showed no evidence that proximity to rivers affects the presence of a stipulation. In the LS findings, 72 percent of land under stipulation is adjacent to rivers and wetlands. The sensitivity analysis on the OM data suggests that contract type do not affect stipulation decisions. However, all the stipulations in the LS dataset are governed by cash rent contracts.

Table 10. Difference in the Findings from the Two Surveys

<table>
<thead>
<tr>
<th></th>
<th>Phone survey in ON and MB (2013) Random sample, Quantitative analysis</th>
<th>Personal interview in Lake Simcoe (2014) Non-random sample, Qualitative analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most common stipulation</td>
<td>Tillage</td>
<td>Crop selection</td>
</tr>
<tr>
<td>Presence of landlord on farm</td>
<td>No evidence</td>
<td>78% of landlords who stipulate live on the farm</td>
</tr>
<tr>
<td>Non-farming landlord</td>
<td>No evidence</td>
<td>37% of landlords who stipulate are non-farmers</td>
</tr>
<tr>
<td>Rivers or wetlands nearby</td>
<td>No evidence</td>
<td>72% of land under stipulation is adjacent to rivers</td>
</tr>
<tr>
<td>Contract type</td>
<td>No evidence</td>
<td>All stipulations are under cash rent agreements</td>
</tr>
</tbody>
</table>

The differences in the findings of the two surveys can be due to different surveying approaches and geographic areas. It is possible that by in-person interviews with an acquaintance, communication is more effective and information is better captured. But it is important to stress that the LS interview produced a non-random sample. The findings are not to be viewed as the general knowledge in the watershed, but merely anecdotal observations. To draw inferences from the results, a follow-up randomized survey is necessary.

8.4 Policy Implications

The findings suggest that the rental market works well to protect farmland quality by stipulating conservation practices in some cases, however, education programs and government support are
still necessary to further farmland conservation by non-farming investors. Non-farming investors account for a large portion of landowners in some areas, however, they lack the knowledge and motivation to conserve farmland quality. Even when they stipulate, the stipulations are more focused on lifestyle and investment, rather than conservation. As revealed by exit interviews with URAs, some tenants accused the developer or contractor landlords of taking interest merely in the monetary value of the land, rather than its productivity. For these investment-oriented landlords, regulations are needed to ensure that they do not make profits at the cost of farmland degradation or loss of threatened species.

The other policy implication of this study is concerning bobolink protection. As the Lake Simcoe interview reveals, regulations aiming to protect threatened species can unexpectedly cause pre-emptive damage to the species and its habitat. The Ontario government needs to re-evaluate its exemption on agricultural activities that harm bobolinks, to avoid the pre-emptive harm when the current extension ends by the end of 2015.
References


65


Appendix A: Lake Simcoe Watershed Farmland Conservation Survey

Lake Simcoe Watershed Farmland Conservation Survey

Instructions:

- Capitalized text enclosed in [SQUARE BRACKETS] are instructions for the surveyor, while those in [italics] indicate that a statement is to be said, upon conditions in the brackets. For example, in the introduction “Good [morning/afternoon/evening]”, the words stated in the square brackets depends on the time of day.
- Text with no formatting is spoken, or for potential answers for the respondent.

Introduction:

“Good [morning/afternoon/evening], my name is [first, last]. I am interviewing on behalf of researchers at the University of Guelph and the Ontario Agricultural College. We are collecting data on agricultural management in the Lake Simcoe Watershed. We are interested in your opinions and insights to help us better understand the issue.”

“If you agree to participate in this survey your responses to these questions will not be released and will be protected to the full extent possible under Canadian law. Please note that you are free to withdraw from the survey at any time and have the right to refuse to answer any question without any consequence. The survey will take approximately 15 to 30 minutes to complete.”

“Your responses will be written on this survey form and entered into a computer. I will not record your name or address, or any other identifying information on the survey form. Therefore, the information you provide will not be recorded in a way that will be linked to you or your address. Please note that it will not be possible to withdraw your survey responses once you have completed the survey and the surveyor has left, as your individual responses will not be able to be traced back to you.”

“This survey has been cleared by the University of Guelph Research Ethics Board under the research ethics board number 14SE005. If you would like more information on the survey or the results you can contact Professor Brady Deaton at the University of Guelph, or the University of Guelph Research Ethics Board. All of the relevant contact information appears in this consent letter [HAND THE CONSENT LETTER TO PARTICIPANT]. Please take a moment to review this letter.”

[IF THE SURVEY IS TAKING PLACE AT THE PARTICIPANT’S FARM, STATE THE FOLLOWING]: “Please be advised that as a visitor on your farm, I have reviewed all appropriate biosafety protocols for visiting farms in Ontario, as outlined by OMAFRA.”.

A.) Are you willing to participate in this survey regarding farming practices in the Lake Simcoe Watershed?
[If Yes] – “Thank you very much”
[If No] – “Thank you, have a great day!”
**Section I – General questions:**

First, we are going to ask you a few general questions about you and your farm operation.

1. So to begin, can you please tell me in what year were you born?

   ________

   (Range = 1900 to 2014)

   [IF 1996 OR LATER THANK AND TERMINATE: “Thank you but for this survey we need to speak with agricultural producers that are at least 18 years of age. Hopefully we can conduct another study with you in the future. Thank you for your time.”]

2. In what county is your home farm located? [DO NOT READ LIST, PLEASE PLACE AN ‘X’ IN THE APPROPRIATE BOX]

   □ Peel  
   □ Simcoe  
   □ Durham  
   □ Kawartha Lakes  
   □ York  
   □ Other [Please specify] ________

3. How many acres of land does your operation farm in 2014, including all rented, leased, or crop-shared lands?

   ________

4. How many acres do you rent, lease or crop-share in 2014?

   ________

5. So you own approximately [INSERT THE ANSWER OF Q.3 - Q.4 here] ________ acres of land, is that right?

   □ Yes  
   □ No

   [IF NO, DISCUSS AND REPEAT Q.3 TO Q.5 UNTIL GETTING YES]
6. What types of livestock do you have on your farm this year? [DO NOT READ LIST, ACCEPT ALL RESPONSES]
   □ Dairy Cattle
   □ Beef Cattle
   □ Sheep
   □ Poultry
   □ Hogs
   □ Other: _____________ [Please specify]
   □ None

7. I am now going to ask about the business structure of your farm operation. Is your farm operation a… [READ LIST]
   □ Sole proprietorship
   □ Partnership
   □ Corporation
   □ Other: _____________ [Please specify] [AS STATED BY RESPONDENT]

8. I am now going to ask about your total farm sales in 2013. Please ask me to stop when I get to the right category. Would you say your 2013 gross farm sales were…[READ LIST]
   □ Less than $50,000
   □ $50,000 to $100,000
   □ $100,000 to $250,000
   □ $250,000 to $500,000
   □ $500,000 to 1 million
   □ 1 million to 2 million
   □ Greater than 2 million

9. What crops did you grow in 2014? We’re interested in all crops on all lands.
   __________________________________________________________

10. Do any of the people you sell your product to require certain production practices? For example, there may be restrictions on fertilizer or herbicide use required by retailers or companies. If there is any requirement about production practices from your downstream buyers, please explain who the buyer is and what the requirement is about.
   □ Yes, please explain____________________________________________________________
   □ No
Section II – Rental contracts

Next I’d like to ask you about the types of rental agreements that you have.

11. How many rental contracts do you have?

[ ]

[IF 0 SKIP TO Q.239]

12. How many of these contracts are cash rental? By that I mean a rental agreement where a fixed annual payment is paid to the landlord, and the tenant owns the entire crop

[ ]

[IF EQUALS ANSWER OF Q.11, SKIP TO Q. 15, OTHERWISE CONTINUE]

13. How many of these contracts are crop share? By that I mean a rental agreement where the tenant gains exclusive use of the plot, bears all the costs of production and shares a portion of the crop with the landlord

[ ]

[IF Q.12+Q.13=Q.11, SKIP TO Q. 15, OTHERWISE CONTINUE]

14. How many of these contracts are cost share? By that I mean a rental agreement where the tenant gives the landlord a share of the crop yield, but the landlord also pays a share of the operating expenses other than the cost of land.

[ ]

15. How many of these contracts are oral?

[ ]

[IF EQUALS ANSWER OF Q.11, SKIP TO Q. 17, OTHERWISE CONTINUE]

16. How many of these contracts are written?

[ ]

17. What length of time is (are) the rental contract(s) for? For example, if the contract was for one year only you would indicate one. Alternatively if it was a two year contract you would indicate two [RECORD ALL ANSWERS]

[ ]
The following questions are designed to assess the extent to which your landlord influences production practices.

[IF MULTIPLE LANDLORDS ARE PRESENT FOR ONE PRACTICE, RECORD ANSWER FOR THE 2 LARGEST PLOTS. PLEASE NUMBER THE ANSWERS, WITH THE LARGER PLOT BEING 1st AND THE SMALLER PLOT BEING 2nd.]

Tillage:

18. Regarding tillage practices, do any of your landlords require you to use no till?
   [DEFINITION IF ASKED: Under the No-Till system, the land is not prepared prior to seeding.]
   □ Yes
   □ No
   [IF NO SKIP TO Q.31, IF YES CONTINUE]

19. How many of your landlords have such requirements?

   ______

20. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.19 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes_____  □ No_____  
   [IF YES SKIP TO Q.22, IF NO CONTINUE]

21. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.19 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes_____  □ No_____  

22. Why do you think the landlord(s) make such requirements? [IF Q.19 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]  

   1st__________________________________________

   2nd__________________________________________
23. Is the management practice the result of an oral or written arrangement? [IF Q.19 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Oral____
   □ Written____
   □ Both: _______/Which one is more typical]/_________

24. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.19 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Cash rental____
   □ Crop share____
   □ Cost share____
   □ Other [Specify]_____

25. Do you think other farmers in your county would use the same practice if it was not required by their landlord?
   □ Yes
   □ No

26. Would you make the same decision if it was not required by the landlord?
   □ Yes
   □ No

27. To your knowledge, what category does this/these landlord(s) fall in? Please indicate all categories that apply. [READ LIST][IF Q.19 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Company or corporation____
   □ Government____
   □ Non-farming investor____
   □ Active farmer____
   □ Spouse of a deceased farmer____
   □ Retired farmer____

28. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST][IF Q.19 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Very poor____
   □ Poor____
   □ Good____
   □ Very good____
   □ Excellent____
29. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.19 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes____
☐ No____

30. Did the requirement influence the rental rate or crop share? [IF Q.19 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes _____ [Please explain]____________________
☐ No____

31. Do any of your landlords require you to use minimum till?
[DEFINITION IF ASKED: Under the minimum tillage system, the crop residue is not plowed under in the fall. In the spring, the field is either cultivated with a chisel plow, disks or coulters that only loosen the soil but do not invert it.]

☐ Yes
☐ No

[IF NO SKIP TO Q.44, IF YES CONTINUE]

32. How many of your landlords have such requirements?

_____

33. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.32 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes____
☐ No____

[IF YES SKIP TO Q.35, IF NO CONTINUE]

34. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.32 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes____
☐ No____

35. Why do you think the landlord(s) make such requirements? [IF Q.32 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]

1st________________________________________________________________

2nd________________________________________________________________
36. Is the management practice the result of an oral or written arrangement? [IF Q.32 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   - Oral____
   - Written____
   - Both ____ [Which one is more typical]____

37. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.32 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   - Cash rental____
   - Crop share____
   - Cost share____
   - Other____ [Specify]____

38. Do you think other farmers in your county would use the same practice if it was not required by their landlord?
   - Yes
   - No

39. Would you make the same decision if it was not required by the landlord?
   - Yes
   - No

40. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST][IF Q.32 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK] [IF Q.19 MORE THAN 1, INDICATE THE NUMBER OF PROPERTY BESIDE THE BOX]
   - Company or corporation____
   - Government____
   - Non-farming investor____
   - Active farmer____
   - Spouse of a deceased farmer____
   - Retired farmer____

41. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST][IF Q.32 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   - Very poor____
   - Poor____
   - Good____
   - Very good____
   - Excellent____
42. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.32 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes____
   □ No____

43. Did the requirement influence the rental rate or crop share? [IF Q.32 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes ____ [Please explain]____________________
   □ No____

44. Are there any requirements about when you till the land?
   □ Yes [Please explain] ______________________
   □ No
   [IF NO SKIP TO Q.57, IF YES CONTINUE]

45. How many of your landlords have such requirements?
   ______

46. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.45 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes____
   □ No____
   [IF YES SKIP TO Q.48, IF NO CONTINUE]

47. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.45 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes____
   □ No____

48. Why do you think the landlord(s) make such requirements? [IF Q.45 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]
   1st_________________________________________________________________________
   2nd_________________________________________________________________________
49. Is the management practice the result of an oral or written arrangement? [IF Q.45 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Oral____
☐ Written____
☐ Both____ [Which one is more typical]________

50. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.45 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Cash rental____
☐ Crop share____
☐ Cost share____
☐ Other____ [Specify]____

51. Do you think other farmers in your county would use the same practice if it was not required by their landlord?

☐ Yes
☐ No

52. Would you make the same decision if it was not required by the landlord?

☐ Yes
☐ No

53. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST][IF Q.45 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK] [IF Q.19 MORE THAN 1, INDICATE THE NUMBER OF PROPERTY BESIDE THE BOX]

☐ Company or corporation____
☐ Government____
☐ Non-farming investor____
☐ Active farmer____
☐ Spouse of a deceased farmer____
☐ Retired farmer____

54. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST][IF Q.45 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Very poor____
☐ Poor____
☐ Good____
☐ Very good____
55. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.45 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No

56. Did the requirement influence the rental rate or crop share? [IF Q.45 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No
   [Please explain]________________________

57. Regarding crop selection, do any of your landlords require a certain choice of crops?
   □ Yes [Please explain]____________________
   □ No
   [IF NO SKIP TO Q.70, IF YES CONTINUE]

58. How many of your landlords have such requirements?
   ______

59. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.58 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No
   [IF YES SKIP TO Q.61, IF NO CONTINUE]

60. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.58 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No

61. Why do you think the landlord(s) make such requirements? [IF Q.58 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]
   1st____________________________________
   2nd________________________________________________________________________
62. Is the management practice the result of an oral or written arrangement? [IF Q.58 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Oral____
   □ Written____
   □ Both____ [Which one is more typical] _________

63. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.58 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Cash rental____
   □ Crop share____
   □ Cost share____
   □ Other____ [Specify] _________

64. Do you think other farmers in your county would use the same practice if it was not required by their landlord?
   □ Yes
   □ No

65. Would you make the same decision if it was not required by the landlord?
   □ Yes
   □ No

66. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST][IF Q.58 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK] [IF Q.19 MORE THAN 1, INDICATE THE NUMBER OF PROPERTY BESIDE THE BOX]
   □ Company or corporation____
   □ Government____
   □ Non-farming investor____
   □ Active farmer____
   □ Spouse of a deceased farmer____
   □ Retired farmer____

67. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST][IF Q.58 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Very poor____
   □ Poor____
   □ Good____
   □ Very good____
68. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.58 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes____
   □ No____

69. Did the requirement influence the rental rate or crop share? [IF Q.58 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes____ [Please explain]____________________
   □ No____

70. Do any of your landlords require use of cover crops?
   □ Yes [Please explain what crops are used]____________________
   □ No
   [IF NO SKIP TO Q.83, IF YES CONTINUE]

71. How many of your landlords have such requirements?

____

72. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.71 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes____
   □ No____
   [IF YES SKIP TO Q.74, IF NO CONTINUE]

73. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.71 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes____
   □ No____

74. Why do you think the landlord(s) make such requirements? [IF Q.71 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]

1st________________________________________________________________
2nd________________________________________________________________
75. Is the management practice the result of an oral or written arrangement? [IF Q.71 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Oral____
☐ Written____
☐ Both____ [Which one is more typical]________

76. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.71 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Cash rental____
☐ Crop share____
☐ Cost share____
☐ Other____ [Specify]_____

77. Do you think other farmers in your county would use the same practice if it was not required by their landlord?

☐ Yes
☐ No

78. Would you make the same decision if it was not required by the landlord?

☐ Yes
☐ No

79. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST] [IF Q.71 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK] [IF Q.19 MORE THAN 1, INDICATE THE NUMBER OF PROPERTY BESIDE THE BOX]

☐ Company or corporation____
☐ Government____
☐ Non-farming investor____
☐ Active farmer____
☐ Spouse of a deceased farmer____
☐ Retired farmer____

80. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST] [IF Q.71 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Very poor____
☐ Poor____
☐ Good____
☐ Very good____
81. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.71 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No

82. Did the requirement influence the rental rate or crop share? [IF Q.71 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes  [Please explain]____________________
   □ No

83. Are there any requirements about the planting order of crops?
   □ Yes, please explain ____________________
   □ No
   [IF NO SKIP TO Q.96, IF YES CONTINUE]

84. How many of your landlords have such requirements?
   
   
85. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.84 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No
   [IF YES SKIP TO Q.87, IF NO CONTINUE]

86. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.84 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No

87. Why do you think the landlord(s) make such requirements? [IF Q.84 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]
   1st________________________________________________________________
   2nd____________________________________ ______________________________
88. Is the management practice the result of an oral or written arrangement? [IF Q.84 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
☐ Oral____
☐ Written____
☐ Both____ [Which one is more typical]________

89. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.84 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
☐ Cash rental____
☐ Crop share____
☐ Cost share____
☐ Other____ [Specify]________

90. Do you think other farmers in your county would use the same practice if it was not required by their landlord?
☐ Yes
☐ No

91. Would you make the same decision if it was not required by the landlord?
☐ Yes
☐ No

92. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST] [IF Q.84 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK] [IF Q.19 MORE THAN 1, INDICATE THE NUMBER OF PROPERTY BESIDE THE BOX]
☐ Company or corporation____
☐ Government____
☐ Non-farming investor____
☐ Active farmer____
☐ Spouse of a deceased farmer____
☐ Retired farmer____

93. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST] [IF Q.84 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
☐ Very poor____
☐ Poor____
☐ Good____
☐ Very good____
94. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.84 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No

95. Did the requirement influence the rental rate or crop share? [IF Q.84 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes [Please explain]____________________
   □ No

Drainage:

96. Regarding drainage systems, do any of your landlords require surface drainage?
   □ Yes
   □ No
   [IF NO SKIP TO Q.109, IF YES CONTINUE]

97. How many of your landlords have such requirements?
   ______

98. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.97 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No
   [IF YES SKIP TO Q.100, IF NO CONTINUE]

99. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.97 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No

100. Why do you think the landlord(s) make such requirements? [IF Q.97 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]

   1st____________________________________________________________

   2nd____________________________________________________________
101. Is the management practice the result of an oral or written arrangement? [IF Q.97 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Oral____
☐ Written____
☐ Both____ [Which one is more typical]________

102. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.97 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Cash rental____
☐ Crop share____
☐ Cost share____
☐ Other ____ [Specify]____

103. Do you think other farmers in your county would use the same practice if it was not required by their landlord?

☐ Yes
☐ No

104. Would you make the same decision if it was not required by the landlord?

☐ Yes
☐ No

105. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST][IF Q.97 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK][IF Q.19 MORE THAN 1, INDICATE THE NUMBER OF PROPERTY BESIDE THE BOX]

☐ Company or corporation____
☐ Government____
☐ Non-farming investor____
☐ Active farmer____
☐ Spouse of a deceased farmer____
☐ Retired farmer____

106. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST][IF Q.97 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Very poor____
☐ Poor____
☐ Good____
☐ Very good____
☐ Excellent

107. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.97 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes
☐ No

108. Did the requirement influence the rental rate or crop share? [IF Q.97 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes [Please explain]____________________
☐ No

109. Do any of your landlords require tile drainage?

☐ Yes
☐ No

[IF NO SKIP TO Q.122, IF YES CONTINUE]

110. How many of your landlords have such requirements?

____

111. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.110 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes
☐ No

[IF YES SKIP TO Q.113, IF NO CONTINUE]

112. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.110 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes
☐ No

113. Why do you think the landlord(s) make such requirements? [IF Q.110 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]

1st________________________________________________________

2nd________________________________________________________
114. Is the management practice the result of an oral or written arrangement? [IF Q.110 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Oral____
   □ Written____
   □ Both ____ [Which one is more typical] ________

115. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.110 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Cash rental____
   □ Crop share____
   □ Cost share____
   □ Other____ [Specify] ________

116. Do you think other farmers in your county would use the same practice if it was not required by their landlord?
   □ Yes
   □ No

117. Would you make the same decision if it was not required by the landlord?
   □ Yes
   □ No

118. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST][IF Q.110 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Company or corporation____
   □ Government____
   □ Non-farming investor____
   □ Active farmer____
   □ Spouse of a deceased farmer____
   □ Retired farmer____

119. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST][IF Q.110 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Very poor____
   □ Poor____
   □ Good____
   □ Very good____
   □ Excellent____
120. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.110 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes____
   □ No____

121. Did the requirement influence the rental rate or crop share? [IF Q.110 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes ____ [Please explain]____________________
   □ No____

Fertilizer/manure:

122. Regarding fertilizer or manure application, do any of your landlords require a certain quantity of fertilizer/manure application?
   □ Yes, please explain __________________
   □ No
   [IF NO SKIP TO Q.135, IF YES CONTINUE]

123. How many of your landlords have such requirements?

   _____

124. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.123 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes____
   □ No____
   [IF YES SKIP TO Q.126, IF NO CONTINUE]

125. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.123 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes____
   □ No____

126. Why do you think the landlord(s) make such requirements? [IF Q.123 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]

   1st________________________________________________________________
   2nd____________________________________________________
127. Is the management practice the result of an oral or written arrangement? [IF Q.123 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Oral____
   □ Written____
   □ Both____ [Which one is more typical] ________

128. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.123 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Cash rental____
   □ Crop share____
   □ Cost share____
   □ Other____ [Specify]_____

129. Do you think other farmers in your county would use the same practice if it was not required by their landlord?
   □ Yes
   □ No

130. Would you make the same decision if it was not required by the landlord?
   □ Yes
   □ No

131. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST][IF Q.123 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Company or corporation____
   □ Government____
   □ Non-farming investor____
   □ Active farmer____
   □ Spouse of a deceased farmer____
   □ Retired farmer____

132. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST] [IF Q.123 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Very poor____
   □ Poor____
   □ Good____
   □ Very good____
   □ Excellent____
133. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.123 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes____
☐ No____

134. Did the requirement influence the rental rate or crop share? [IF Q.123 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes____ [Please explain]____________________
☐ No___

135. Do any of your landlords specify the type of fertilizer to be applied?

☐ Yes [Please explain]____________________
☐ No

[IF NO SKIP TO Q.148, IF YES CONTINUE]

136. How many of your landlords have such requirements?

____

137. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.136 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest. INDICATE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes____
☐ No____

[IF YES SKIP TO Q.139, IF NO CONTINUE]

138. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.136 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes____
☐ No____

139. Why do you think the landlord(s) make such requirements? [IF Q.136 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]

1st____________________________________________________

2nd____________________________________________________
140. Is the management practice the result of an oral or written arrangement? [IF Q.136 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Oral____
☐ Written____
☐ Both____ [Which one is more typical]________

141. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.136 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Cash rental____
☐ Crop share____
☐ Cost share____
☐ Other ____ [Specify]____

142. Do you think other farmers in your county would use the same practice if it was not required by their landlord?

☐ Yes
☐ No

143. Would you make the same decision if it was not required by the landlord?

☐ Yes
☐ No

144. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST][IF Q.136 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK][IF Q.19 MORE THAN 1, INDICATE THE NUMBER OF PROPERTY BESIDE THE BOX]

☐ Company or corporation____
☐ Government____
☐ Non-farming investor____
☐ Active farmer____
☐ Spouse of a deceased farmer____
☐ Retired farmer____

145. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST] [IF Q.136 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Very poor____
☐ Poor____
☐ Good____
☐ Very good____
☐ Excellent____
146. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.136 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes____
   □ No____

147. Did the requirement influence the rental rate or crop share? [IF Q.136 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes ____ [Please explain]________________________
   □ No____

148. Do any of your landlords specify Manure, Nitrogen, Phosphorus, or Potash to be applied?
   □ Yes [Please indicate]________________________
   □ No
   [IF NO SKIP TO Q.161, IF YES CONTINUE]

149. How many of your landlords have such requirements?
   ______

150. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.149 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes____
   □ No____
   [IF YES SKIP TO Q.152, IF NO CONTINUE]

151. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.149 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes____
   □ No____

152. Why do you think the landlord(s) make such requirements? [IF Q.149 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]
   1st_____________________________________________________________________
   2nd_____________________________________________________________________
153. Is the management practice the result of an oral or written arrangement? [IF Q.149 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Oral____
☐ Written____
☐ Both____ [Which one is more typical]________

154. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.149 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Cash rental____
☐ Crop share____
☐ Cost share____
☐ Other____ [Specify]________

155. Do you think other farmers in your county would use the same practice if it was not required by their landlord?

☐ Yes
☐ No

156. Would you make the same decision if it was not required by the landlord?

☐ Yes
☐ No

157. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST][IF Q.149 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Company or corporation____
☐ Government____
☐ Non-farming investor____
☐ Active farmer____
☐ Spouse of a deceased farmer____
☐ Retired farmer____

158. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST][IF Q.149 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Very poor____
☐ Poor____
☐ Good____
☐ Very good____
☐ Excellent____
159. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.149 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   ☐ Yes ___
   ☐ No ___

160. Did the requirement influence the rental rate or crop share? [IF Q.149 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   ☐ Yes ___ [Please explain] ____________________
   ☐ No ___

161. Are there any requirements about when you apply fertilizer or manure?
   ☐ Yes [Please explain] ____________________
   ☐ No
   [IF NO SKIP TO Q.174, IF YES CONTINUE]

162. How many of your landlords have such requirements?
   ______

163. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.162 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   ☐ Yes ___
   ☐ No ___
   [IF YES SKIP TO Q.165, IF NO CONTINUE]

164. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.162 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   ☐ Yes ___
   ☐ No ___

165. Why do you think the landlord(s) make such requirements? [IF Q.162 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]
   1st ____________________________________________
   2nd ____________________________________________
166. Is the management practice the result of an oral or written arrangement? [IF Q.162 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Oral
☐ Written
☐ Both [Which one is more typical] ________

167. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.162 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Cash rental
☐ Crop share
☐ Cost share
☐ Other [Specify] ________

168. Do you think other farmers in your county would use the same practice if it was not required by their landlord?

☐ Yes
☐ No

169. Would you make the same decision if it was not required by the landlord?

☐ Yes
☐ No

170. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST][IF Q.162 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Company or corporation
☐ Government
☐ Non-farming investor
☐ Active farmer
☐ Spouse of a deceased farmer
☐ Retired farmer

171. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST][IF Q.162 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Very poor
☐ Poor
☐ Good
☐ Very good
☐ Excellent
172. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.162 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
  □ Yes___
  □ No___

173. Did the requirement influence the rental rate or crop share? [IF Q.162 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
  □ Yes___ [Please explain]__________________________
  □ No___

174. Are there any requirements about the method you use to apply fertilizer or manure?
   □ Yes [Please explain] ____________________________
   □ No

   [IF NO SKIP TO Q.187, IF YES CONTINUE]

175. How many of your landlords have such requirements?

   ______

176. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.175 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes___
   □ No___

   [IF YES SKIP TO Q.178, IF NO CONTINUE]

177. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.175 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes___
   □ No___

178. Why do you think the landlord(s) make such requirements? [IF Q.175 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]

   1st________________________________________________________________
   2nd____________________________________________
   ______________________
179. Is the management practice the result of an oral or written arrangement? [IF Q.175 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
- □ Oral_____ 
- □ Written_____ 
- □ Both_____ [Which one is more typical]__________

180. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.175 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
- □ Cash rental____ 
- □ Crop share____ 
- □ Cost share____ 
- □ Other____ [Specify]________

181. Do you think other farmers in your county would use the same practice if it was not required by their landlord?
- □ Yes 
- □ No

182. Would you make the same decision if it was not required by the landlord?
- □ Yes 
- □ No

183. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST][IF Q.175 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
- □ Company or corporation_____ 
- □ Government_____ 
- □ Non-farming investor_____ 
- □ Active farmer_____ 
- □ Spouse of a deceased farmer_____ 
- □ Retired farmer_____ 

184. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST][IF Q.175 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
- □ Very poor____ 
- □ Poor____ 
- □ Good____ 
- □ Very good____ 
- □ Excellent____
185. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.175 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No

186. Did the requirement influence the rental rate or crop share? [IF Q.175 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes ___ [Please explain] ______________________
   □ No

187. Do any of your landlords require fertility management programs to keep track of nutrient levels in the soil?
   □ Yes [Please explain] ______________________
   □ No
   [IF NO SKIP TO Q.200, IF YES CONTINUE]

188. How many of your landlords have such requirements?
   __________

189. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.188 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No
   [IF YES SKIP TO Q.191, IF NO CONTINUE]

190. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.188 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No

191. Why do you think the landlord(s) make such requirements? [IF Q.188 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]
   1st ____________________________________________________________
   2nd ____________________________________________________________
192. Is the management practice the result of an oral or written arrangement? [IF Q.188 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Oral____
☐ Written____
☐ Both____ [Which one is more typical]_______

193. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.188 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Cash rental____
☐ Crop share____
☐ Cost share____
☐ Other____ [Specify]_____

194. Do you think other farmers in your county would use the same practice if it was not required by their landlord?

☐ Yes
☐ No

195. Would you make the same decision if it was not required by the landlord?

☐ Yes
☐ No

196. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST] [IF Q.188 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK] [IF Q.19 MORE THAN 1, INDICATE THE NUMBER OF PROPERTY BESIDE THE BOX]

☐ Company or corporation____
☐ Government____
☐ Non-farming investor____
☐ Active farmer____
☐ Spouse of a deceased farmer____
☐ Retired farmer____

197. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST] [IF Q.188 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Very poor____
☐ Poor____
☐ Good____
☐ Very good____
☐ Excellent____
198. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.188 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No

199. Did the requirement influence the rental rate or crop share? [IF Q.188 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes [Please explain]____________________
   □ No

Herbicide:

200. Regarding herbicide application, do any of your landlords require a certain quantity of herbicide application?
   □ Yes [Please explain]____________________
   □ No

201. How many of your landlords have such requirements?

   ______

202. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.201 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No

203. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.201 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes
   □ No

204. Why do you think the landlord(s) make such requirements? [IF Q.201 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]

   1st________________________________________________________________

   2nd_________________________________________________________
205. Is the management practice the result of an oral or written arrangement? [IF Q.201 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   - □ Oral____
   - □ Written____
   - □ Both____ [Which one is more typical]________

206. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.201 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   - □ Cash rental____
   - □ Crop share____
   - □ Cost share____
   - □ Other____ [Specify]______

207. Do you think other farmers in your county would use the same practice if it was not required by their landlord?
   - □ Yes
   - □ No

208. Would you make the same decision if it was not required by the landlord?
   - □ Yes
   - □ No

209. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST][IF Q.201 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   - □ Company or corporation____
   - □ Government____
   - □ Non-farming investor____
   - □ Active farmer____
   - □ Spouse of a deceased farmer____
   - □ Retired farmer____

210. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST][IF Q.201 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   - □ Very poor____
   - □ Poor____
   - □ Good____
   - □ Very good____
   - □ Excellent____
211. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.201 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes 
☐ No

212. Did the requirement influence the rental rate or crop share? [IF Q.201 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes [Please explain] 
☐ No

213. Do any of your landlords specify the type of herbicide to be applied?

☐ Yes [Please explain] 
☐ No

[IF NO SKIP TO Q.226, IF YES CONTINUE]

214. How many of your landlords have such requirements?

____

215. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.214 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes 
☐ No

[IF YES SKIP TO Q.217, IF NO CONTINUE]

216. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.214 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes 
☐ No

217. Why do you think the landlord(s) make such requirements? [IF Q.214 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]

1st __________________________________________

2nd __________________________________________
218. Is the management practice the result of an oral or written arrangement? [IF Q.214 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Oral____
☐ Written____
☐ Both____ [Which one is more typical]____

219. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.214 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Cash rental____
☐ Crop share____
☐ Cost share____
☐ Other____ [Specify]____

220. Do you think other farmers in your county would use the same practice if it was not required by their landlord?

☐ Yes
☐ No

221. Would you make the same decision if it was not required by the landlord?

☐ Yes
☐ No

222. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST][IF Q.214 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK] [IF Q.19 MORE THAN 1, INDICATE THE NUMBER OF PROPERTY BESIDE THE BOX]

☐ Company or corporation____
☐ Government____
☐ Non-farming investor____
☐ Active farmer____
☐ Spouse of a deceased farmer____
☐ Retired farmer____

223. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST][IF Q.214 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Very poor____
☐ Poor____
☐ Good____
☐ Very good____
☐ Excellent____
224. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.214 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes____
☐ No____

225. Did the requirement influence the rental rate or crop share? [IF Q.214 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes___ [Please explain]____________________
☐ No____

226. Are there any requirements about when you apply herbicide?

☐ Yes [Please explain] ______________________
☐ No
[IF NO SKIP TO Q.239, IF YES CONTINUE]

227. How many of your landlords have such requirements?

____

228. Do(es) the landlord(s) live on the farm from which you rent land? [IF Q.227 MORE THAN 1, SAY “We will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes____
☐ No____
[IF YES SKIP TO Q.230, IF NO CONTINUE]

229. Do(es) the landlord(s) live within 5 km of the farm from which you rent land? [IF Q.227 MORE THAN 1, SAY “Again, we will only record 2 properties. Please start from the largest property to the second largest.” INDICATE NUMBER OF PROPERTIES IN THE BLANK]

☐ Yes____
☐ No____

230. Why do you think the landlord(s) make such requirements? [IF Q.227 MORE THAN 1, SAY “Please start from the largest property to the second largest.”]

1st________________________________________________________________

2nd________________________________________________________________
231. Is the management practice the result of an oral or written arrangement? [IF Q.227 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Oral____
   □ Written____
   □ Both____ [Which one is more typical]________

232. Is the management practice the result of a cash rental, crop share, or cost share arrangement? [IF Q.227 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Cash rental____
   □ Crop share____
   □ Cost share____
   □ Other____ [Specify]____

233. Do you think other farmers in your county would use the same practice if it was not required by their landlord?
   □ Yes
   □ No

234. Would you make the same decision if it was not required by the landlord?
   □ Yes
   □ No

235. To your knowledge, what category does this(these) landlord(s) fall in? Please indicate all categories that apply. [READ LIST][IF Q.227 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Company or corporation____
   □ Government____
   □ Non-farming investor____
   □ Active farmer____
   □ Spouse of a deceased farmer____
   □ Retired farmer____

236. How would you compare the quality of this parcel to other land in your area? Would you consider it to be: [READ LIST][IF Q.227 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Very poor____
   □ Poor_____ 
   □ Good____
   □ Very good____
   □ Excellent_____
237. Are there any wetlands, rivers, streams or lakes within or adjacent to this property? [IF Q.227 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes ___  
   □ No ___

238. Did the requirement influence the rental rate or crop share? [IF Q.227 MORE THAN 1, SAY “Please start from the largest property to the second largest.” INDICATE THE NUMBER OF PROPERTIES IN THE BLANK]
   □ Yes ___ [Please explain]____________________
   □ No ___

Section III – Farming Practices on Owned Land

[IF PARTICIPANT DOES NOT OWN LAND, SKIP TO SECTION IV]
Now I am going to ask you a set of general questions about conservation practices on your own land.

239. Did you plant a cover crop on your own land in 2014?
   □ Yes  
   □ No

240. To your knowledge, has your owned land been improved for agricultural purposes by surface or tile drainage?
   □ Yes  
   □ No  
   □ Don’t Know

241. In 2014, was your owned land primarily prepared using: [READ LIST]
   □ No-Till  
   □ Minimum or Conservation Tillage  
   □ Conventional Tillage

242. Did you apply manure on your own land in 2014?
   □ Yes  
   □ No

243. Did you apply herbicide on your own land in 2014?
   □ Yes  
   □ No

Section IV – Fertilizer Use and Management on Rented vs. Owned Land
Finally, I’d like to ask you some questions about fertilizer use and your opinions on farmland management on owned and rented land.
244. To your best estimate, how many pounds of fertilizer did you apply per acre in 2014?

___________

245. All else equal, do you think farmers in your county take better care of the land they own than the comparable land that they rent? [PLEASE PLACE AN ‘X’ IN THE APPROPRIATE BOX]

☐ Yes
☐ No
☐ Don’t Know

[IF YES, MOVE ON. OTHERWISE SKIP TO Q.247]

246. a) Do you think farmers in your county use more fertilizer or manure on the land they own than the comparable land that they rent? [PLEASE PLACE AN ‘X’ IN THE APPROPRIATE BOX]

☐ Yes
☐ No
☐ Don’t Know

b) Do you think some farmers use more phosphorus fertilizer on the land they own than the comparable land that they rent? [PLEASE PLACE AN ‘X’ IN THE APPROPRIATE BOX]

☐ Yes
☐ No
☐ Don’t Know

c) Do you think farmers in your county use more nitrogen fertilizer on the land they own than the comparable land that they rent? [PLEASE PLACE AN ‘X’ IN THE APPROPRIATE BOX]

☐ Yes
☐ No
☐ Don’t Know

247. Do you think farmers in your county use a more complex crop rotation on the land they own than the comparable land that they rent? [PLEASE PLACE AN ‘X’ IN THE APPROPRIATE BOX]

☐ Yes
☐ No
☐ Don’t Know

Section V – Wrap-up

[CLOSE]

Thank you very much for participating in our survey. We are very thankful for your time and patience. A summary report of this study will be made available by contacting Dr. Brady Deaton. Have a nice day!
Appendix B: Information Letter

Greetings,

You are being asked to participate in a short survey on behalf of researchers at the University of Guelph and the Ontario Agricultural College. We are collecting data on agricultural management in the Lake Simcoe Watershed. We are interested in your opinions and insights to help us better understand the issue.

Please note that you are free to withdraw from the survey, and have the right to refuse to answer any question without any consequence. The survey will take approximately 10 to 20 minutes to complete.

Your responses will be written on this survey form and entered into a computer. I will not record your name or address. Therefore the information you provide will not be recorded in a way that will be linked to you or your address. Please note that it will not be possible to withdraw your survey responses once you have completed the survey and the surveyor has left, as your individual responses will not be able to be traced back to you.

This survey has been cleared by the University of Guelph Research Ethics Board under the research ethics board number 14SE005.

If you would like more information on the survey or the results you can contact the primary investigator, Professor Brady Deaton, at the University of Guelph. He can be reached by email at bdeaton@uoguelph.ca, or phone at 519-824-4120 extension 52765. When you call please inform him you are calling about the Lake Simcoe Survey. None of your contact information will be retained by the research team, and will be discarded at the conclusion of the correspondence. You can also contact the University of Guelph Research Ethics Board at 519-824-4120 extension 56606, or by email at reb@uoguelph.ca. When you call please inform them you are calling about the Lake Simcoe Survey and provide the REB number stated above.

Kind Regards,

Brady T. Deaton

Brady Deaton
Associate Professor
Department of Food, Ag. and Resource Economics
University of Guelph
bdeaton@uoguelph.ca
tel. 519-824-4120 x 52765
Appendix C: Glossary (Alphabetical, By Category)

Types of Landlords

**Corporation**: Any type of business structure other than sole proprietorship and partnership is a corporation.

**Partnership**: With a partnership, financial resources are combined and put into the business. As partners, you would share in the profits of your business according to the terms of your agreement.

**Sole proprietorship**: As a sole owner of the business, you are fully responsible for all debts and obligations related to your business and all profits would be yours alone to keep.

Types of Rental Arrangements

**Cash rental**: A rental agreement where a fixed annual payment is paid to the landlord, and the tenant owns the entire crop.

**Cost share**: A rental agreement where the tenant gives the landlord a share of the crop yield, but the landlord also pays a share of the operating expenses other than the cost of land.

**Crop share**: A rental agreement where the tenant gains exclusive use of the plot, bears all the costs of production, and shares a portion of the crop with the landlord.

Conservation Practices

**Minimum till**: Under the minimum tillage system, the crop residue is not plowed under in the fall. In the spring, the field is either cultivated with a chisel plow, disks or coulters that only loosen the soil and does not invert it.

**No-till**: Under the no-till system, the land is not prepared prior to seeding.
Appendix D: Biosafety Information Handout

This information page is provided to help you understand the biohazards involved in visiting participants’ farms and best practices for ensuring biosecurity during farm visits.

Why? Who?

Biosecurity at the farm level can be defined as the management practices enabling producers to prevent the movement of disease-causing agents onto and off of agricultural operations. Although controlling and limiting the movement of livestock is recognised as the most important biosecurity measure for most diseases, many important hazards can be carried on contaminated clothing, boots, equipment and vehicles. This applies to anyone entering or leaving the premises who may be visiting other livestock operations, and not just those of the same species or commodity type.

Expectations of your visit

- Make an appointment for a specific date and time to visit the farm (do not “drop by”)
- Prior to your visit, ask the farm operator about his or her biosecurity protocol, and any special measures that must be taken
- Be prepared to accept all reasonable directives from the farmer when visiting his or her operation
- Wear sanitized shoes or boots during your visit
- Minimize animal contact before and during the visit

I __________________ have read the biosafety information provided and I understand the risks regarding my visit to the participating farms. I will follow the procedures suggested above and by farmers, to the full extent.

Signature:__________________

Date:__________________