

# NICHE AND DIRECT MARKETING IN THE RURAL-URBAN FRINGE:

*A Study of the Agricultural Economy  
in the Lower Mainland and Fraser Valley*

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TRACY STOBBE, ALISON J. EAGLE,  
G.C. VAN KOOTEN\*

**C**OMPETITION BETWEEN AGRICULTURE and urban land uses is common worldwide. In a classic von Thünen (1826) model of land rent, land decreases in value in concentric circles around a city, with rents higher for locations closer to the city and/or those with greater fertility. This model is complicated by many factors (trade, increasing urbanization, technological changes, transportation corridors, etc.) that increase the value of developed land relative to that of agriculture. As a result, productive farmland near cities has been converted to urban uses at an alarming rate, thus adversely affecting the provision of public goods and other non-market amenities that citizens desire, including open space, landscape views, protection of air and water quality, and wildlife habitat. Disregard of these non-market values leads to inefficiencies and the under-supply of agricultural land near cities. Although a variety of public policies has been implemented to protect farmland, it is increasingly difficult for farmers to survive in the rural-urban fringe (RUF). The main challenge facing agricultural producers in the RUF relates to the high cost of land, which greatly exceeds the value of land in agriculture, although there are other factors as well (Stobbe, Cotteleer, and van Kooten 2009; Stobbe et al. 2010). Farmers are under financial stress and need to find new ways to survive.

Recently, concerns over climate change, energy consumption, food quality and variety, and agronomic practices have prompted widespread

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demand for local and/or organically grown food. Direct marketing of agricultural products by the farmer to the consumer is growing in prevalence and popularity, as witnessed by the exceptional growth of farmers' markets in the past decade (Shore 2010). In this article, therefore, we examine the economic prospects and sustainability of farmers' adaptations to the challenges of the RUF in British Columbia's Lower Mainland and Fraser Valley through such activities as organic production, direct marketing, and other innovative marketing techniques as well as through the intensification of production.

Primary data from a survey of farmers within Metro Vancouver (MV) and the Fraser Valley Regional District (FVRD) are used to address the following questions:<sup>1</sup> What strategies do farmers pursue to secure an adequate income? What obstacles and challenges do they encounter? Does investment in agricultural land generate sufficient returns from agricultural production or are landowners increasingly dependent on capital gains from rising land prices? Do farming strategies that differ from the conventional commodity-based marketing system improve agricultural returns on investment? How do farmers utilizing organic production and/or direct marketing methods differ from other farmers in the same region, if at all? Do farmers benefit financially from environmentally friendly agricultural practices? What is the effect of local, provincial, and federal agricultural and non-agricultural policies on agriculture in the RUF?

We begin by presenting background information, including a discussion of agricultural production at the urban fringe and associated economic issues, recent developments in local and organic agricultural marketing, and a description of the study region and the relevant agricultural policies that affect it. Then we describe the research methods used before presenting descriptive results, statistical models of key factors, and a discussion of the results. A final section provides some conclusions and discusses policy implications.

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<sup>1</sup> In 2007, the Greater Vancouver Regional District (GVRD) was renamed Metro Vancouver (MV). One of the main survey areas, Langley, lies within this regional district. The other main survey area, Abbotsford, lies within the Fraser Valley Regional District (FVRD). As per common usage, the title "Lower Mainland" is used interchangeably with MV throughout this article to mean the regional district.

## THEORETICAL FRAMEWORK

*Addressing Spillovers*

Productive agriculture in the rural-urban fringe faces not only unique challenges but also unique opportunities. On the negative side, agricultural production costs are higher due to competition for land and other resources (e.g., water) and due to urban-source externalities such as pollution and congested roads (along which farmers move farm equipment between fields and transport products to market) (Eagle 2009). Farmers face increased costs due to vandalism and the need to ward off trespassers; they also face potentially reduced yields due to pollution and local bylaws that restrict fertilizer and pesticide use. Further, when significant suburban residential development expands into the countryside with non-agricultural estates/acreages, farmland is fragmented and the local farm economy may be weakened as a result of declining upstream services (e.g., farm equipment sales and repairs, farm input suppliers, etc.). Also, by fragmenting the farm landscape, these hobby farms and large estates increase the potential for conflicts related to farm “nuisances” and make it difficult for successful farms to expand their operations. Meanwhile, farmers are under-compensated (or not compensated at all) for the provision of landscape views, open spaces, and other environmental services enjoyed by the public. From economic theory, we know that the negative externalities experienced by farmers and lack of compensation for the positive externalities result in reduced agricultural output and the under-supply of desirable rural amenities.

On the plus side, the advantages that farmers in the RUF have over farmers elsewhere are: (1) easier access to off-farm employment, which provides a financial backstop not available in other farming communities; (2) the non-conventional marketing of farm products through farmers’ markets, local restaurants, and so on; (3) access to a larger labour pool than exists in more remote rural areas; (4) more nearby customers for direct farm sales; and (5) greater possibilities to sell agri-tourism. High land prices also stimulate greenhouse and nursery investments that intensify the agricultural productivity of land (Cotteleer, Stobbe, and van Kooten 2009).

Farmland protection is often initiated by urban residents. Over 90 percent of BC residents support urban development limits in order to protect farmland (Quayle 1998), while 95 percent favour policies that preserve farmland (Ipsos Reid Public Affairs 2008). The vast majority

(94 to 98 percent) of residents also feel that agriculture benefits the community even without lifestyle or employment connections (BC Ministry of Agriculture and Lands 2007; Walker 2005). Therefore, urban residents have a significant impact on the policies that affect land use and land use change at the urban fringe. Farmland protection mechanisms have been instituted in British Columbia and other regions, but the primary impetus has been to prevent sprawl and development on farmland rather than to optimize agricultural production and land use.

Throughout Canada, jurisdictions at different levels have implemented policies to protect farmland and farm practices (e.g., “right-to-farm” legislation), while offering varying levels of support to marketing initiatives. Reduced agricultural property taxes shift more of a municipality’s tax burden to non-farming residents, in effect providing some compensation for the provision of farm-related public goods.<sup>2</sup> These and other farmland protection measures, along with product marketing support, address challenges that are unique to urban-fringe agriculture, where heightened land-use competition and environmental quality concerns are more visible. In British Columbia, the most notable provincial policies are the Agricultural Land Reserve (ALR) created by the Agricultural Land Commission Act, 1973/2002, and the Farm Practices Protection (Right to Farm) Act, 1996. Established in 1973, when approximately six thousand hectares of farmland were lost to development each year (Hanna 1997), the ALR removes the development potential from agricultural land,<sup>3</sup> which reduces market prices (Eagle 2009; Stobbe 2008), and the Right to Farm Act provides a forum for addressing conflicts related to farm practices.

<sup>2</sup> Eligible farmland in British Columbia benefits from reduced property taxes. While farmland tax rates vary by municipality, the land-only property tax can be as low as 5 to 8 percent of that for an equivalent parcel not having farm status (Eagle 2009). The thresholds for meeting farm status are low: for a parcel of 0.8 to 4.0 hectares, \$2,500 of annual gross farm receipts must be earned once every two years to qualify. If a parcel can be included within a larger farm, the annual gross farm-income requirement for land to achieve farm status can be as low as 5 percent of the actual farm-purpose value (e.g., \$180/ha for land assessed at \$3600/ha). The tax system undoubtedly benefits farmers, but an unintended consequence is the incentive it provides to those who would purchase a small farm as an alternative to a residential lot in the city, thereby converting agricultural land into large rural estates that are used as marginally productive hobby farms (Stobbe, Cotteleer, and van Kooten 2009).

<sup>3</sup> The size of the ALR has actually grown over time. But most of the exclusions are in the fertile south and most of the inclusions are in the more arid north. The ALC has also undergone changes in its administrative structure, moving from a provincial board to six regional boards in 2002. Little empirical research has looked at the changing land composition of the ALR (most studies are either from an advocacy approach or use a case-study methodology), but recent work by Stobbe et al. (2010) econometrically examines ALR data.

As a result of their close proximity to urban neighbours and an influx of non-farm rural dwellers, the success and survival of RUF farms also depends on effective communication with neighbours, buffers between incompatible land uses, and appropriate policies that protect normal farm practices. Governments and others can also work to encourage the buildup of social capital in the community (Libby and Sharp 2003). Social capital is comprised of relationship networks, trust (e.g., among neighbours), reciprocity, and positive emotions; it reduces conflicts and can have an impact on the effect and utility of different policy choices in land-use management.

Research on farmland values finds that price per unit area decreases with increased parcel size and greater distance from major cities (Cotteleer, Stobbe, and van Kooten 2010; Huang et al. 2006). As agricultural land at the urban fringe is developed and/or subdivided, land prices increase due to expectations for continued development and increased urbanization of farm areas. These expectations often result in disinvestment in agriculture as farmland is left idle or diverted to activities that use mobile capital (Berry 1978). This phenomenon is referred to as the impermanence syndrome.

### *Why Farmers Farm in the RUF*

Farmland prices in the RUF are generally much higher than they are elsewhere. This is due to speculation that farmland, which may even be part of the ALR, will some day be developed, and it is also because farmland (even in the ALR) is purchased for residential purposes, with modest-sized rural holdings serving as viable alternatives to urban residential lots when price and other factors (environmental amenities, distances, etc) are taken into account (Cotteleer, Stobbe, and van Kooten 2010). Indeed, once the price of farmland is taken into account, many agricultural activities in the RUF are no longer profitable in a strict cost-benefit sense (Stobbe, Cotteleer, and van Kooten 2009). Therefore, agricultural producers are motivated by something other than profit from farm-gate sales.<sup>4</sup>

Agricultural economists assume that farmers maximize their utility, where utility is a function not of income but of the things income can buy plus the things it cannot buy (e.g., environmental amenities, job

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<sup>4</sup> Clearly, there are exceptions. In the Lower Mainland, there are profitable farms, many of which are established (and thus did not have to pay high prices for land or for milk/egg quota) and/or are in more lucrative sectors, such as nurseries or berries.

satisfaction, creativity, being one's own boss, etc.). Some agricultural producers own their land and have no mortgage (perhaps it was purchased many years ago or was received as an inheritance); they do not have the financial pressure of paying for the land input, although the land rent must be taken into account as an opportunity cost. Other agricultural producers are middle aged or older and purchase a farm because they want a change in lifestyle and so turn to farming either full time or part time with off-farm employment. They may have little to no experience of farming but make organic farming or country living a lifestyle choice, perhaps in keeping with their social conscience.<sup>5</sup> With rising land prices they can realize capital gains on the land sold during retirement, with gains perhaps exceeding the interest lost on their capital during those years. However, these rising land prices create a problem for the next generation of farmers. Left to the market, the future of this type of food regime is deeply uncertain. Increasingly, the Nature Conservancy and other NGOs or government organizations are purchasing farmland and providing long-term leases to new farmers or reselling it with strict easements on it (which prohibit development and thus permanently lower its market price) to enable the continuation of farming (Curran and Stobbe 2010).

### *Direct Marketing*

Farmers in the RUF choose a variety of methods to produce and market their products. Producers who view farming as a profession rather than as a lifestyle may place greater emphasis on earnings and, thus, produce and market products that yield the highest net returns. Some farmers emphasize concern for the environment, leading them to produce organic outputs in the most environmentally beneficial ways, subject to the constraints (e.g., need to have a certain level of income) they face. Yet others prefer interacting with customers or showing other farmers how capable they are, thus emphasizing direct forms of marketing such as farmers' markets. The choice of what, how, and where to produce will depend on a farmer's preferences and her or his income, time, and other constraints. As a result, producers in the RUF employ a variety and a mix of strategies, many of which are not available to producers elsewhere. For example, market vegetable, greenhouse, and organic production

<sup>5</sup> One analyst in the BC Ministry of Agriculture pointed out that this is often the situation, with people from elsewhere in Canada buying agricultural land and farming it for a short period because they view it as a lifestyle choice (R. Kline, Regional Agrologist, BC MAL, personal communication, 2006).

tend to be concentrated near urban centres (Beauchesne and Bryant 1999; Frederiksen and Langer 2004; Purdy 2005). The past decade has seen strong growth in direct farm marketing, certification of organic agriculture, and intensive production methods (Hofmann, Dennis, and Marshall 2009; Macey 2004; Purdy 2005). By utilizing direct-farm sales and agri-tourism, these innovations are also able to capture some of the non-market value associated with public goods. Producers might view direct marketing and agri-tourism as a means of increasing revenue at a lower cost than is possible in conventional farming. However, it might also be that they see these alternatives as the only way to stay in agriculture for lifestyle reasons or out of sentimental connections (e.g., saving the family farm).

### *Organic Production and Demand for Local Food*

The (real and perceived) environmental and social benefits from organic and locally oriented agriculture have prompted a move towards, and advocacy for, organic food production and direct marketing. In addition to using fewer external inputs (primarily chemicals) than conventional farming (Hoeppner et al. 2005; Stockdale et al. 2001), agro-ecological methods commonly used in organic farming reduce soil erosion and nutrient losses from leaching (Poudel et al. 2002; Reganold, Elliott, and Unger 1987) and increase the biodiversity of both agricultural and native species on farms (Bengtsson et al. 2005). In some cases, organic agricultural practices have improved soil quality (Glover, Reganold, and Andrews 2000), although some studies have found lower levels of available nutrients (Gosling and Shepherd 2005). Therefore, although the environmental benefits appear to be primarily positive, the entire agricultural system needs to be considered when determining impacts on long-term sustainability.

By paying higher prices and/or incurring higher costs to reach local farm-stands, consumers demonstrate a willingness to pay for locally produced products that may also incorporate environmentally friendly practices such as organic production or integrated pest management (IPM). Increased consumer demand for locally produced products is also observed in the growth of community supported agriculture (CSA) programs and farmers' markets, in supermarket purchases of local products, and in media publicity (Buck, Getz, and Guthman 1997; Darby et al. 2008; Ross 2006). The book and blog *The Hundred Mile Diet* (Smith and MacKinnon 2005) continue to enjoy popularity and

have given us a common term. With increasing public awareness of environmental sustainability issues (e.g., climate change), much current support for locally and regionally produced food centres around reducing greenhouse gas emissions related to transportation and production. The perceived positive health benefit of local food, primarily fresh fruits and vegetables, has prompted provincial education and health authorities to lend support to the marketing of local agricultural products (British Columbia 2007; Herman et al. 2008).

Local farm products can and do enter the conventional food marketing chain for sale in grocery stores (Hild 2009), but some experts believe that direct marketing, through farm stands, farmers' markets, community supported agriculture (CSA) box programs, and so on, is the only way for near-urban farmers to attain sufficient income in the current economy (B. Warner, Regional Agrologist, BC MAL, personal communication, 2005). Some increasingly popular restaurants promoting unique and local food have also become a significant market outlet for farm products. Agri-tourism can also increase consumer awareness of agricultural systems, thus enhancing social capital (neighbour relations), providing market outlets, and improving farm economic sustainability. Although requiring some different skills than those involved in farm production, direct marketing can help farmers recapture some of the financial value otherwise going to wholesalers, distributors, and retailers. Some consumers and farmers attach a premium to face-to-face interactions that is not possible via conventional channels.

## STUDY REGION

While the total number of farms in Canada continues to decline (by 37.3 percent from 1971 to 2006), BC farm numbers have increased (by 7.8 percent in the same period). However, the growth in average farm receipts in British Columbia has not kept pace with the rest of the country (83 percent growth versus 143 percent growth in the rest of Canada), suggesting that farms in this province are becoming less productive and less competitive, perhaps because of the large number of hobby farms (Stobbe et al. 2010). In 2006, 48 percent of BC farms were hobby farms, earning less than \$10,000 in gross farm income, versus 22 percent for all Canadian farms. On a more positive note, British Columbia's trend towards smaller farms might improve environmental stewardship, given concerns that, with fewer farmers managing increasingly larger tracts of land across the country, land managers are unable to provide sufficient environmental oversight, although this remains a contentious issue.



The study region – MV and the FVRD in southwestern British Columbia – is broadly represented in this survey by the municipalities of Langley and Abbotsford. Langley is a rapidly developing urban fringe area, situated within MV (a forty-five-minute commute to Vancouver city centre).<sup>6</sup> Abbotsford is somewhat farther away in the FVRD and is approximately an hour's commute from Vancouver, although traffic congestion during peak hours can significantly increase the duration of this commute. The Langley and Abbotsford municipalities each exceed three hundred square kilometres in size and together have a population of more than 200,000 (Table 1). Annual population growth rates in these areas ranged between 5 and 6.5 percent throughout the 1970s and early 1980s but dropped to less than 2 percent after 2000.

About 2.7 percent of British Columbia's nearly 92.5 million hectares is capable of supporting agriculture, but barely 0.6 percent is prime farmland (soil classes 1 to 3) (Runka 2006). The soils and climate in MV and the FVRD are significant as their fertility, rainfall levels, and long growing season make them some of Canada's best agricultural land. MV's farmland accounts for just 1.4 percent of the province's total but produces over 27 percent of the farm gate receipts (Statistics Canada 2006a), while the FVRD, with 1.7 percent of provincial farmland, produces over 35 percent of the province's farm gate receipts (Statistics Canada 2006a; British Columbia n.d.). In contrast, rural agricultural areas in other parts of British Columbia are characterized by relatively low average population density and more extensive agricultural activity (Table 1). MV and the FVRD produce a large variety of agricultural outputs from raspberries, cranberries, and blueberries to grains and horticultural crops, dairy, and greenhouse products (British Columbia 2006).

## RESEARCH METHODS

In November 2008, a mail-out survey was sent to farmers in MV and the FVRD who market their products locally and/or who use organic production practices. A list of 116 farmers was compiled from two publicly available lists – the Direct Farm Marketing Association (DFMA) and the Certified Organic Associations of British Columbia (COABC).<sup>7</sup>

<sup>6</sup> "Langley" is comprised of the City of Langley, a smaller, more urbanized centre, and the Township of Langley, which is much larger and encompasses almost all of the farmland in the two municipalities.

<sup>7</sup> Survey respondents were offered a fifteen-dollar Home Depot gift card and a twenty-five-dollar coupon to a local restaurant. In December 2008, a follow-up postcard reminded farmers of the survey. Finally, in January 2009, follow-up phone calls were made and/or e-mails sent.

TABLE 1

*Selected Population and Agricultural Statistics for British Columbia and Two Municipalities in the Study Region (Abbotsford and Langley)*

	BRITISH COLUMBIA	ABBOTSFORD	LANGLEY
Area, km <sup>2</sup>	924,815	359.4	306.9
POPULATION			
1971	2,184,621	31,033	21,936
2006	4,113,487	123,864	93,726
% of change 1971 to 2006	+ 88.3	+ 299.1	+ 427.3
% of change 2001 to 2006	+ 5.3	+ 7.2	+ 7.9
Pop'n density, 2006, per km <sup>2</sup>	4.2	344.7	305.4
AGRICULTURE, 2006 DATA			
Number of farms	19,844	1,197	1,292
Total farm area, ha	2,835,458	27,295	12,970
% of total area	3.1	76.0	42.3
Average farm size, ha	143	23	10
% of farms <4 ha (10 acres)	27	29	49
% of farms <\$10,000 gross income	48	28	54

*Source:* Census of Agriculture (Statistics Canada 2006a); Census of Canada (Statistics Canada 1971, 2001, 2006b).

In total, twenty-nine surveys were returned for a response rate of 25 percent.<sup>8</sup>

Thirty-five percent of surveyed farms were located in Langley or nearby Aldergrove, 41 percent in Abbotsford, 17 percent in other municipalities in the MV (e.g., Delta or Surrey), and 7 percent from other municipalities in the FVRD (e.g., Chilliwack). With the majority of farms in Langley and Abbotsford, comparisons with the Agricultural Census focus on these two municipalities. We use a series of t-tests to

<sup>8</sup> This response rate is not atypical of such surveys. For example, a telephone survey of farmers conducted for the Canadian government by the Environics Research Group (2000) reported a response rate of 12 percent, about the same as that reported by Bell et al. (1994) in their study of farmers' participation in Tennessee's Forest Stewardship Program.

determine whether there were significant differences between Statistics Canada's information on all farmers in the area and our sample of direct marketing and organic farmers. We also test for differences within the sample between geographic areas and different farm activities (organic versus conventional, agri-tourism versus other, etc.).

Regression analyses were conducted using STATA 10. With different variables of interest, the regression models followed the function form:

$$Y_i = \alpha_o + \alpha_1 C_{1i} + \dots + \alpha_K C_{Ki} + \beta_1 F_{1i} + \dots + \beta_M F_{Mi} + \varepsilon_i$$

where  $Y_i$  represents the  $i^{\text{th}}$  observation of the dependent variable (of which there are several);  $C$  is a set of  $K$  farm characteristics;  $F$  is a set of operator characteristics;  $\alpha_j$  ( $j = 0, \dots, K$ ) and  $\beta_m$  ( $m = 1, \dots, M$ ) are parameters to be estimated; and  $\varepsilon$  is the error term for  $n$  farms.

A logistical binary (logit) model is also utilized in the analysis, with the dependent variable taking on a value of 1 if the farm has agri-tourism and 0 if otherwise. We can write the probability of a farm participating in agri-tourism as:

$$P_i = E(Y=1|X_i) = \frac{1}{1 + e^{-(\beta_1 + \beta_2 X_i)}}$$

where  $\beta_1$  represents the coefficient on an intercept term and  $\beta_2$  represents a vector of coefficients on the vector of regressors,  $X$ .

Finally, the results were compared to a very similar survey conducted on the Saanich Peninsula during the spring of 2008.

## RESULTS

### *Descriptive Results*

About 46 percent of the farms in Abbotsford and 33 percent of those in Langley are less than four hectares in size.<sup>9</sup> The median farm size was 10.1 hectares (mean of 32.2 hectares due to an outlier at 283 hectares) (Figure 1). Farm products included vegetables, berries, eggs, dairy, chickens, and bees (honey) (Figure 2).

<sup>9</sup> A clear definition of a hobby farm does not exist. Revenue Canada, for instance, defines it as a farm that requires off-farm income to support it. Statistics Canada uses a definition of less than \$10,000 gross farm receipts. In the survey, responses were unrepresentative of actual distribution of hobby farms using the < \$10,000 gross receipts method as only two farms (both in MV, representing 7.14 percent of the total sample) earned less than \$10,000.

FIGURE 1  
*Distribution of Farm Sizes*

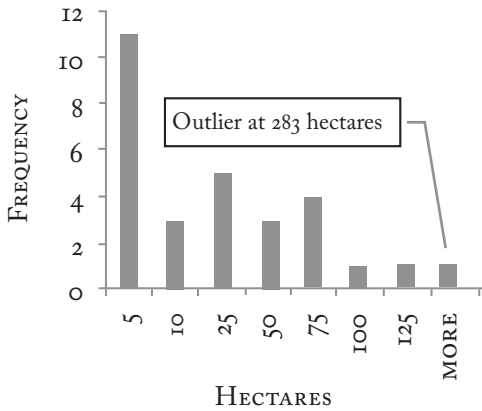
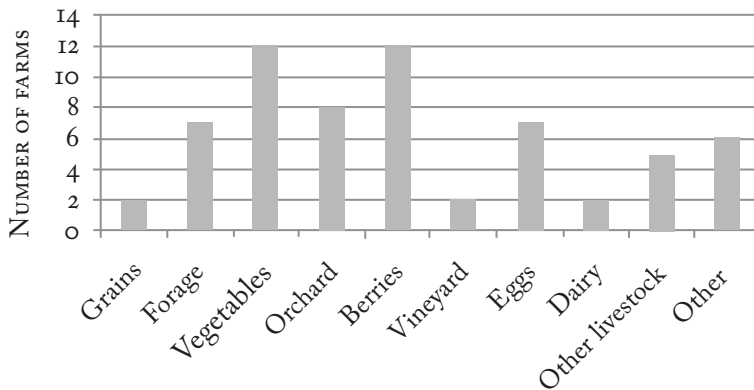


FIGURE 2  
*Agricultural Products Reported*<sup>10</sup>



The average age of the primary farm operator was 53 years, and ranged from under 25 years to over 75 years (Table 2). Abbotsford farmers tended to be younger than those in Langley (average age of 47 versus 53 years). These ages are similar to those reported in the Census of Agriculture (Statistics Canada 2006a), confirming that survey participants are representative of the total farmer population in this respect, which means

<sup>10</sup> Note that some farms produce more than one type of product.

that direct marketing and organic farmers are similar to other farmers. Respondents have an average of 21.3 years of farming experience with a range of two to forty years. Female operators (comprising 28 percent of all primary operators) tend to have fewer years of farming experience (15.4 years) than male operators (23.6 years).

TABLE 2  
*Age Distribution of Sample*

AGE CATEGORY	FREQUENCY (%)
Younger than 25 years	3.4
25 to 34 years	6.9
35 to 44 years	20.7
45 to 54 years	13.8
55 to 64 years	37.9
65 to 74 years	13.8
75 years and older	3.4

Survey respondents have a wide range of education levels; 10 percent completed high school; 38 percent completed some college, university, or trade school; 24 percent graduated from college, university, or trade school; 14 percent had a master's degree; and 14 percent had a PhD. Furthermore, they tend to be more educated than the average population: 90 percent of farm operators have completed at least some post-secondary education, while only 60 percent of the BC population aged 25 to 74 (51 percent in Abbotsford, 59 percent in Langley) are educated past high school (Statistics Canada 2006b).

Farm income and financial success varied greatly. Reported gross farm receipts averaged \$464,000 (median \$375,000), but two farms had less than \$10,000 while six reported over \$1 million (Table 3). For net farm income, the average was \$75,600 (median \$17,500), but over a third of respondents earned less than \$5,000 net farm income (and two farms reported losses). Almost 80 percent of farms reported carrying farm debt, although the debt is highly skewed (Table 4).

TABLE 3  
*Gross Farm Receipts (2007) Frequencies*

GROSS RECEIPTS	NO. OF FARMS	PERCENT (%)
Less than \$10,000	2	6.9
\$10,000 up to \$25,000	2	6.9
\$25,000 up to \$50,000	4	13.79
\$50,000 up to \$100,000	3	10.34
\$100,000 up to \$250,000	3	10.34
\$250,000 up to \$500,000	6	20.69
\$500,000 up to \$1 million	3	10.34
More than \$1 million	6	20.69

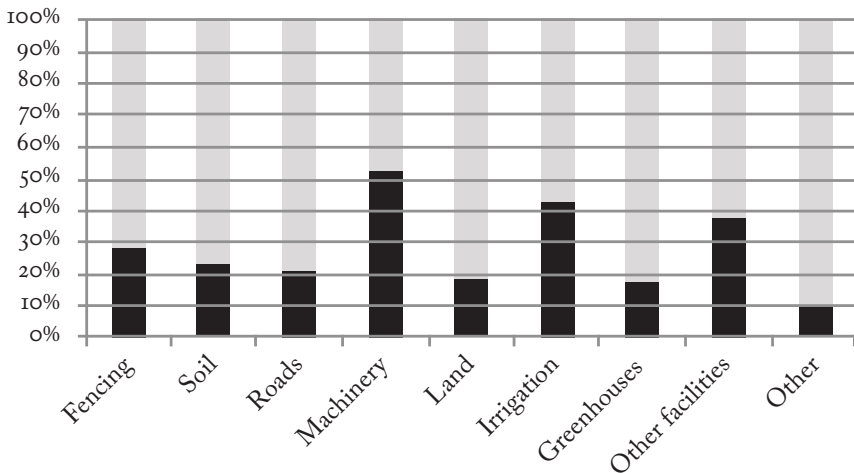
TABLE 4  
*Farm Debt (as of 2007) and Net Farm Income (2007) Frequencies*

DEBT	FARM DEBT		NET FARM INCOME	
	NO. OF FARMS	PERCENT (%)	NO. OF FARMS	PERCENT (%)
Less than \$5,000	6	21.43	10	34.49
\$5,000 up to \$10,000	1	3.57	2	6.9
\$10,000 up to \$25,000	2	7.14	5	17.24
\$25,000 up to \$50,000	1	3.57	4	13.79
\$50,000 up to \$100,000	1	3.57	2	6.9
\$100,000 up to \$250,000	3	10.71	2	6.9
\$250,000 up to \$500,000	6	21.43	3	10.34
More than \$500,000	8	28.57	1	3.45

All farms in the survey used some equipment.<sup>11</sup> The average value of farm equipment was \$211,000 per farm (\$140,000 if an outlier at \$2,340,000 is removed); 86 percent of farms use tractors, 55 percent use cultivators, 34 percent use processing equipment, 31 percent use rototillers, and 28 percent use harvesters. Almost 90 percent of surveyed farms employ hired labour. Twelve farms (41.38 percent) employ year-round full-time labour, eight farms (27.59 percent) employ year-round part-time labour, ten farms (34.49 percent) employ seasonal full-time labour, and fourteen farms (48.28 percent) employ seasonal part-time labour.<sup>12</sup>

Investments in new machinery, facilities, land, fencing, or soil improvements over the last five years averaged \$319,000 per farm (median \$41,000). Figure 3 shows the different types of farm investments – new machinery, irrigation investments, and facilities other than greenhouses top the list. Finally, Figure 4 shows how investment dollars across all farms are distributed across the different categories of investment. Though 41 percent of farms made some irrigation investments, the fact that irrigation accounts for only 4 percent of total investment dollars indicates that irrigation is a relatively cheap investment to make. A similar story can be told for fencing, soil improvement, and road investments.

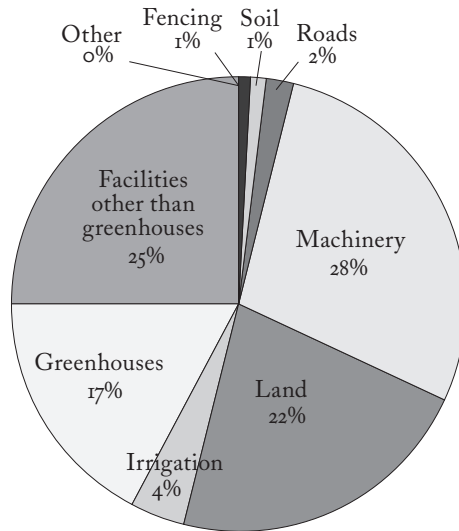
FIGURE 3  
*Percentage of Farms Making Investments in Different Areas (2002–07)*



<sup>11</sup> One farm reported no equipment but indicated that a neighbour brought in the crop (hay) for them. It is reasonable to assume that the neighbour used equipment in doing so.

<sup>12</sup> These numbers do not total to 100 percent because several farms report that multiple categories of labour are employed.

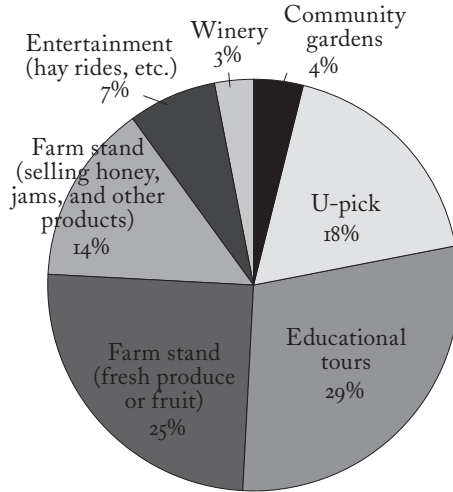
FIGURE 4  
*Distribution of Total Investment Dollars (2002-07)*



One of our key research questions concerns the differences between niche or direct marketing farmers and conventional farmers. In the survey, twenty-two farms (75.9 percent) use non-conventional production practices (IPM, certified organic, or non-certified organic) on at least half of their land (and a majority use it on all of their land). Ten farms (34.5 percent) use only certified-organic production practices, and 59 percent of respondents are involved in agri-tourism, as shown in Figure 5. Most marketing still occurs through traditional routes, such as wholesalers (43.6 percent), distributors (9 percent), and processors (25.6 percent). A smaller share is sold via direct marketing routes such as farmers' markets (3.7 percent) and U-pick or farm stands (15.4 percent). Since farmers were asked to participate in this survey on the basis of their membership in the Direct Farm Marketing Association (DFMA) or the Certified Organic Associations of British Columbia (COABC), it is surprising that a relatively small proportion of their products are marketed through direct marketing. Perhaps some farms are converting to direct marketing techniques or perhaps the demand or infrastructure for direct-marketed products is not yet sufficient to allow for full direct marketing. Quite possibly a mixed strategy (of some conventional marketing and some direct marketing) is the economically efficient business practice at this time.



FIGURE 5  
*Agri-tourism Activities*<sup>13</sup>



One way to measure farm success is to ask farmers directly about the situation on their farm. The results from two opinion questions are summarized in Table 5, which reveals a great deal of variability in how farmers feel about their financial position. Negative opinions about the ability to build equity (41.4 percent) far outweigh positive opinions (20.6 percent).

TABLE 5  
*Two Opinion Questions Dealing with the Farm’s Financial Success (where 0 is “strongly disagree” and 5 is “strongly agree”)*

SCALE	“I AM SATISFIED WITH OUR CURRENT LEVEL OF FARM INCOME”	“OUR HOUSEHOLD FARM INCOME IS SUFFICIENT TO MAINTAIN OUR STANDARD OF LIVING AND BUILD EQUITY/CAPITAL”
0	3.4 %	27.6 %
1	20.7 %	13.8 %
2	24.1 %	17.2 %
3	20.7 %	20.7 %
4	10.3 %	10.3 %
5	20.7 %	10.3 %

<sup>13</sup> Note that several farms have multiple agri-tourism activities represented in this pie chart.

The level of dependence on off-farm employment offers another indicator of farm success. If farmers have to rely less on off-farm income, it implies that they are more successful at their agricultural operation. It also could provide insights into how many are lifestyle or hobby farmers (though this is an imperfect measure) (Table 6).

TABLE 6  
*Off-Farm Income*

PROPORTION OF OFF-FARM INCOME	FREQUENCY (%)
Less than 10% of total income	28
10% to 25% of total income	17
26% to 50% of total income	14
51% to 75% of total income	14
76% to 90% of total income	7
More than 90% of total income	21

One measure of agricultural sustainability in the urban fringe is whether farms are able to co-exist peacefully with residential neighbours and other land uses. In the survey, 45 percent of respondents reported taking action (spending either time or money) to resolve or prevent a conflict with a non-farming neighbour. These actions included changing the nature of farming activities to reduce dust, odour, or noise (71.4 percent); installing vegetative buffers between properties (57.1 percent); participating in environmental conservation efforts (57.1 percent); and participating in local agriculture awareness campaigns (14.3 percent). On average, these respondents spent forty hours a year resolving or preventing conflicts (range from 1 to 156 hours). Five farmers (17 percent) spent an average of almost \$2,000 resolving or preventing conflicts (with a range of \$300 to \$5,000).

### *Statistical Analysis*

Are farms in MV different from those in the FVRD? The use of t-tests reveals several statistical differences between MV and FVRD farms. MV farms incorporate agri-tourism to a higher degree than do FVRD farms ( $p = 0.014$ ). Not surprisingly, MV farms also rely more on U-pick marketing than do FVRD farms ( $p = 0.059$ ). Respondents from the FVRD tend

to have more strongly positive opinions about the ALR, right-to-farm legislation, and local agricultural zoning ( $p = 0.017$ ,  $0.056$ , and  $0.054$ , respectively). Finally, though only moderately significant, it appears that MV farms have more women as primary operators ( $p = 0.13$ ).

Upon segmenting by farmers' use of conventional growing practices versus IPM/organic growing practices, conventional farmers have been farming for longer ( $p = 0.033$ ), but organic farmers have more operators per farm ( $p = 0.014$ ) as well as more female operators ( $p = 0.026$ ).

Farms not using agri-tourism have significantly higher net farm income ( $p = 0.037$ ), spend significantly more time on resolving or preventing conflicts with non-farm neighbours ( $p = 0.081$ ), and invest more in machinery and irrigation ( $p = 0.053$  and  $p = 0.028$ ). Operators who rely on agri-tourism have a moderately higher percentage of off-farm income ( $p = 0.113$ ) and tend to be older ( $p = 0.037$ ).

Twenty percent of the Langley farmers in our survey had gross farm receipts of less than \$10,000 per year, whereas 54 percent of those enumerated by Census Canada were in this category; our Abbotsford sample included no farmers returning less than \$10,000, whereas the census found 28 percent in this category. This is encouraging because it indicates that a high proportion of the respondents contribute significantly to the agricultural economy. Although the census indicates that 57 percent of farms in Langley have debt, 75 percent of our survey respondents from Langley claimed to be in debt. For Abbotsford, the equivalent figures are 33 percent and 80 percent, respectively.

We utilize correlation models to determine interrelations among factors in the survey. Off-farm income is negatively related to gross receipts ( $r = -0.6592$ ) and net farm income ( $r = -0.6518$ ), indicating that those with a higher percentage of off-farm income have lower gross farm receipts and lower net farm income. Off-farm income is also moderately negatively related to vegetable production ( $r = -0.3504$ ) and berries ( $r = -0.3039$ ) but positively related to dairy ( $r = 0.3217$ ). In sum, vegetable and berry growers are less reliant on off-farm income than are dairy operators.

Those with innovative marketing practices also rely more on off-farm income ( $r = 0.5169$ ). Innovative marketing is associated with agri-tourism ( $r = 0.5063$ ) and is moderately negatively associated with both time spent on resolving or preventing conflicts ( $r = -0.2745$ ) and money spent on conflicts ( $r = -0.2434$ ). This may indicate that those using agri-tourism and innovative marketing have fewer conflicts with neighbours or can more easily resolve them. This is reinforced by the fact that farmers using higher proportions of conventional methods tend to spend more

money on resolving or preventing conflict ( $r = 0.8237$ ). Finally, conflicts with neighbours are associated with growing berries ( $r = 0.3426$ ) and with higher gross farm receipts ( $r = 0.3709$ ). The association of berry production and conventional farming methods with conflict is not surprising because conventional farms tend to employ more intensive production methods, including application of manure, and berry growers often use propane cannons to deter birds from eating their crops (both of which are negative externalities for urban residents).

### *Regression Results*

Multivariate regression models have the advantage of being able to compare many variables at once while controlling for the influence of other variables. Several regression models are employed, including both linear and binary-dependent models. The first model examines factors related to gross farm receipts (Table 7, first column). Curiously, years of farming is negatively related to gross farm receipts, although receipts rise with an increase in the number of operators working the farm.

Grain crops provide lower revenues on average than do other crops. Reliance on direct or niche marketing practices also lowers gross farm receipts, but social capital (as measured by volunteer work or membership in a professional organization) enhances farm earnings (indicating perhaps that farms with wider social networks and more professional expertise and involvement tend to be higher grossing). Unsurprisingly, as a farm household's reliance on off-farm income rises, farm receipts decline. Farm earnings rise with operator age.

The second model examines factors associated with social capital – namely, the amount of money spent on resolving or preventing conflicts with neighbours (Table 7, second column). Some of the most interesting results here show that: for every additional year of farming, people spend about \$15 more mitigating conflicts;<sup>14</sup> increasing the number of farm operators by one leads to about \$379 more spent on conflict-mitigating expenditures; grain growers spend about sixty-four dollars more on average; agri-tourism farmers spend about \$1,509 less than do those without agri-tourism; and those who donated blood, volunteered their time, or donated to a charity spent less on conflict reduction/prevention (\$1,234, \$564, and \$401, respectively). Clearly, neighbours are

<sup>14</sup> More years spent farming is positively correlated with expenditures to reduce or to prevent conflicts in this model. Over the entire dataset, this result tells us that, as years spent farming increases by one, on average fifteen dollars more is spent on reducing or preventing conflicts.

TABLE 7  
*OLS Regression Model Results (n = 29)*

VARIABLE	MODEL 1	MODEL 2
	Y=GROSS FARM RECEIPTS (\$)	Y=MONEY SPENT REDUCING CONFLICTS (\$)
	COEF. (P-VALUE)	COEF. (P-VALUE)
Years farming	-0.076 (0.091) *	15,322 (0.016) **
Own the farm? (0 no, 1 yes)		-33,359 (0.899)
Number of operators	1.139 (0.052) **	378.53 (0.006) ***
Grains	-0.245 (0.086) *	63,783 (0.005) ***
Forage	0.026 (0.277)	10.108 (0.064) *
Vegetables	0.007 (0.150)	
Berries	-0.001 (0.759)	10.18 (0.000) ***
Dairy	0.041 (0.001) ***	3,379 (0.100) *
Total value of equipment		-0.002 (0.000) ***
Total investments (past 5 years)		0.001 (0.000) ***
Gross farm receipts		86.077 (0.095) *
Net farm income		-58.903 (0.149)
Agri-tourism? (0 no, 1 yes)	0.592 (0.415)	-1508.86 (0.000) ***
Innovative marketing? (0 no, 1 yes)	-4.485 (0.000) ***	162.979 (0.524)
Donated blood in past year? (0 no, 1 yes)	1.351 (0.207)	-1234.11 (0.001) ***
Volunteered in the past year? (0 no, 1 yes)	2.072 (0.036) **	-563.998 (0.009) ***
Gave to charity in past year? (0 no, 1 yes)		-400.800 (0.025) **
Hosted a party in the past year? (0 no, 1 yes)		1269.51 (0.000) ***
Belong to professional org.? (0 no, 1 yes)	1.727 (0.035) **	
Attend church/temple regularly? (0 no, 1 yes)		164.224 (0.184)
Percent of off-farm income	-0.395 (0.072) *	97.46 (0.086) *
Age	1.047 (0.034) **	
Education	-0.321 (0.166)	33.815 (0.282)
Do you own your home? (0 no, 1 yes)		-543.485 (0.052) **
Opinion on agricultural imports	0.894 (0.002) ***	
Opinion on returns on farm investments	0.528 (0.040) **	
Constant	-1.314 (0.495)	144.808 (0.642)
R <sup>2</sup>	0.9212	0.9653

Note: \*, \*\*, and \*\*\* denote significance at the 0.1, 0.05, and 0.01 levels, respectively.

more positively inclined towards agri-tourism operations, while social capital (as measured by community involvement) facilitates acceptance of agricultural activities in the community. Notice, however, that hosting a private party is not considered a mechanism for enhancing social capital; indeed, it appears to reflect negatively on the farm, with those who indicated that they host parties having to spend more (\$1,270 annually) to appease neighbours.

Very few factors proved to affect the total value of products marketed through innovative methods.<sup>15</sup> The model presented in Table 8 indicates that innovation reduces gross farm receipts. This result could support the conjecture that farmers are turning to innovative marketing in the Fraser Valley as a last ditch attempt to save their farms, perhaps because the innovations promise higher returns in the future. Alternatively, it could simply indicate that farmers pursue innovative marketing as a lifestyle choice rather than for profit-related reasons. For example, farmers may prefer the direct contact with customers that farmers' markets and farm stands offer, even though this results in their earning less profit on average. Further, as the number of farm operators increases, the total value of goods sold through innovative channels by that farm also increases. This result may, however, be biased by the few farms in the survey that have multiple operators and sell their products through a co-op.

TABLE 8  
*OLS Regression Results: Dependent Variable is the Total Value of Products Marketed by Innovative Methods – Farmers' Markets, CSAs and Co-ops (n = 29)*

EXPLANATORY VARIABLE	COEF. (P-VALUE)
Gross farm receipts	-0.14721 (0.000) ***
Number of farm operators	0.14025 (0.025) **
Constant	1.14105 (0.000) ***
R <sup>2</sup>	0.6337

Note: \*, \*\*, and \*\*\* denote significance at the 0.1, 0.05, and 0.01 levels, respectively.

<sup>15</sup> Innovative methods include farmers' markets, farm stands, CSAs, off-farm retail, co-ops, and restaurants.

In the final regression model (Table 9), we focus on factors explaining respondents' decisions to pursue agri-tourism ventures. Do these farms offer agri-tourism activities as a way of meeting a perceived demand and thus maximizing profits? Or is it a choice implemented as a last chance to save the agricultural business? Or are other factors leading farmers to offer agri-tourism options? Results indicate that landowners are less likely to engage in agri-tourism as net farm income increases, when operators spend more time earning off-farm income, if a significant investment in the farm has been made in the last five years and if vegetables or grain production are the principal activities of the farm enterprise. Agri-tourism is highly correlated with age (with older farmers more likely to do agri-tourism) and, to a lesser extent, with farm size (larger farms more likely to have agri-tourism) and education (more educated farmers more likely to have agri-tourism). Agri-tourism ventures are not as profitable as conventional farms, and they seem to be run by people who fit the same mould as hobby farmers (Stobbe et al. 2009). This suggests that lifestyle factors may be more important to farmers pursuing agri-tourism ventures than simply maximizing their agricultural profit.

TABLE 9  
*Logistic Regression Model Results: Dependent Variable = 1 if Farm has Agri-tourism, 0 otherwise (n = 29)*

INDEPENDENT VARIABLE	COEF. (P-VALUE)
Education	0.77933 (0.152) +
Age	1.35235 (0.033) **
Net farm income	-1.60926 (0.021) **
Percent of off-farm income	-0.72780 (0.159)
Vegetables	-0.09374 (0.095) *
Grains	-0.44144 (0.037) **
Total investments (past 5 years)	-4.89 e-06 (0.083) *
Total acres	0.03984 (0.112) +
Constant	1.30986 (0.621)
Pseudo R <sup>2</sup>	0.5421

Note: +, \*, \*\*, and \*\*\* denote borderline significance and significance at the 0.1, 0.05, and 0.01 levels, respectively.

*Comparisons with the Saanich Peninsula*

While agriculture near different urban centres will have common characteristics (benefits and challenges) due to location (Bryant and Johnston 1992), agriculture in British Columbia's Lower Mainland and Fraser Valley – including direct marketing and organic farming – is significantly different from that on the Saanich Peninsula on Vancouver Island (near the capital city, Victoria). For all farm marketing types, farms on the Lower Mainland are larger (both in physical size and gross income), there are fewer hobby farms, and organic farming is less prevalent (Statistics Canada 2006a). We compare results from a previous survey on the Saanich Peninsula with the current research, finding additional differences, and some similarities, between direct marketing and organic farmers in the two regions.

While the farmers surveyed in both regions were selected from comparable lists of certified organic growers and those marketing through the local farm direct marketing associations, size differences prevail and marketing of farm products differs significantly. In MV and the FVRD, almost 80 percent of direct marketing and organic farms carry debt, while producers on the Saanich Peninsula are largely debt-free (75 percent of those with less than \$10,000 in gross farm income had no farm debt) (Eagle 2009). The average gross farm receipts and physical farm size in the Lower Mainland and Fraser Valley were more than twice that on the Saanich Peninsula (Table 10). More of the farms in the Lower Mainland and Fraser Valley derive the majority of household income from the farm, although there is still a significant dependence on off-farm income in both regions. Farmers in Saanich are also somewhat younger and have less experience farming.

Direct farm sales play a much larger role near Victoria as 59 percent of total farm product value on the Saanich Peninsula was direct-marketed, compared with only 20 percent in the Lower Mainland and in the Fraser Valley. In Figure 6, a breakdown of marketing of all farm products for both regions is provided. Farm stands are prominent near Victoria, likely because the farms are within an easy drive of the majority of the urban population. Being further removed from the dense urban market leaves Lower Mainland and Fraser Valley farmers more reliant on wholesalers, distributors, and processors. Also, the larger concentration of farms in the Lower Mainland and Fraser Valley may make such businesses more viable.



TABLE 10

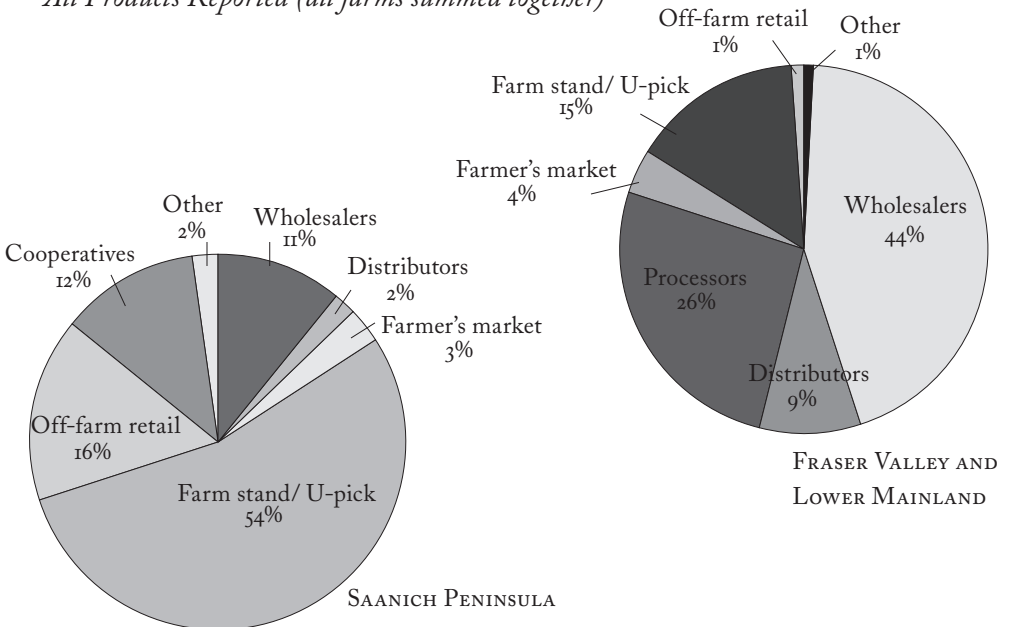
*Selected Characteristics of Direct Marketing and Organic Farmers in Two Regions of British Columbia (values are the mean of observations unless otherwise indicated)*

	SAANICH PENINSULA		LOWER MAINLAND / FRASER VALLEY	
	ALL FARMS (N = 25)	>\$10,000 GROSS RECEIPTS (N = 20)	ALL FARMS (N = 29)	>\$10,000 GROSS RECEIPTS (N = 27)
Annual gross farm receipts, \$	196,400	244,000	463,600	497,600
Farm size, ha	13.1	15.8	32.2	34.2
Most (>90%) of household income comes from farm	20%	25%	28%	29%
Farmer age	50.5	50.2	52.9	52.7
Years farming	16	17	21	22
Investments in past 5 yrs, \$	92,000	111,000	319,300	341,600
# of operators per farm	2.0	2.1	1.9	1.9
Certified organic	36%	30%	38%	33%

Source: Eagle et al. 2009 compared with results from current survey.

FIGURE 6

*Marketing of Farm Products for the Fraser Valley and Saanich Peninsula: Farms Listed as Direct Marketers and/or Organic Producers. Charts Indicate Proportion of All Products Reported (all farms summed together)*



## DISCUSSION AND CONCLUSIONS

Our results are both anticipated and surprising. The general perception is that farmers in the rural-urban fringe use direct marketing and innovative methods because these are more financially secure than more conventional agronomic practices and marketing methods. However, the data are not clear on this point and do not wholly support this conclusion. Farmers using direct or niche marketing (such as organic) do not appear to be more profitable than conventional farmers, and those using agri-tourism do not seem to fare better financially, generally having lower net farm incomes. Rather, the evidence supports our theoretical contention that farmers' maximize a preference function that includes lifestyle and other factors unique to this occupation rather than only the material benefits that higher incomes can provide. Nonetheless, farmers are constrained by a need to meet expenses and earn some income, which will vary from one agricultural producer to another.

We find that farms employing agri-tourism are associated with lower financial and time costs (e.g., dealing with neighbours to resolve or prevent conflicts) than are those that do not employ agri-tourism. It is easy to imagine how agri-tourism operations could result in traffic and parking problems and, perhaps, frequent trespass of neighbours' properties. The fact that these data show lower levels of negative externalities spilling onto neighbours could indicate that the scale of agri-tourism is small and/or that landowners with agri-tourism enterprises have focused on reducing their negative effects on neighbours. Agri-tourism provides benefits to the local economy as tourists and residents alike can purchase locally grown food direct from producers, can enjoy entertaining and educational farm experiences, and can find on-site bed and breakfasts. If agri-tourism and direct marketing are associated with reduced conflict, this could be an effective rural-urban edge planning tool for government to pursue. To develop appropriate public policy, more research is needed to determine the precise challenges and opportunities facing these enterprises.

Perhaps surprisingly, we find that, as determined by the Census of Agriculture, only 1.14 percent of direct marketing operations (using the \$10,000 gross farm receipts definition) are hobby farms, compared to 48 percent in the MV region (Statistics Canada 2006a). There is no widely accepted definition of what constitutes a hobby farm, so this question cannot be resolved entirely, but if the current survey is indicative of the larger farm economy, then governments wishing to preserve commercially viable agriculture (and wishing to discourage hobby farming)

should consider what they can do to encourage direct marketing and, importantly, to increase its profitability.<sup>16</sup>

It is clear from our survey that, although direct marketing is potentially beneficial for the farmer and society, it is not without its challenges. Not only is it correlated with lower gross farm receipts but it is also associated with higher farm indebtedness. One explanation is that direct or innovative agricultural marketing requires greater investment and that such investments still need to pay off; however, it could also be that those turning to direct marketing are already heavily indebted and see this as a final opportunity to make their agricultural enterprise profitable. Interestingly, research on the Saanich Peninsula did not show the same results as did the Lower Mainland and Fraser Valley survey. Thus, a lingering question that future research can address is why direct marketers seem to have different outcomes in the two regions. Future research could also identify historical marketing strategies on farms and answer the question of which came first: the debt or the direct marketing?

While more citizens are purchasing local farm products and the numbers of farmers' markets are increasing (e.g., Langley's first farmer's market opened in July 2009 but Vancouver had four that year, including one year-round farmers' market), further survey research is needed to more fully explore the issues raised in this article and to establish whether direct marketing, organic production and certification, and other agricultural marketing innovations will enable farms to survive the unique challenges of producing in the rural-urban fringe in the long term.

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<sup>16</sup> Many government reports have pointed out the preponderance of hobby farms in the mv region (for instance, Curran and Stobbe 2010). The high proportion of hobby farms and farmland fragmentation are frequently cited as serious threats to the farm economy in the region.

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