

Agricultural Land Values – Can Productive Agriculture Survive Development Pressures in British Columbia?

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1.0 Background

Most residents of BC want to protect the province's agricultural land. Surveys report that 90% of British Columbians believe that government should limit urban development to protect farmers and farmland (Quayle 1998) and 81% of Central Saanich residents feel that farmland preservation is beneficial (Walker 2005). This public sentiment stems from strong values for open space retention and historical agricultural activities, recognition of agricultures' significant role in ecosystem biodiversity and conservation, and concern for the local agricultural economy and community interests.

Less than 3% of BC's land area is capable of growing a reasonable range of crops and only 0.6% is classed as prime agricultural soil (Runka 2006). Concern about urban sprawl and loss of prime farmland to development led to the formation of BC's Agricultural Land Reserve (ALR) in 1973, establishing limits on subdivisions and non-farm activities for agriculturally zoned land. The majority of BC's cultivated agricultural land is now protected within the ALR.

Table 1. Selected human population and farm statistics, Canada and British Columbia

	1971	2006	% Change
Canada			
Population	21 568 311	31 612 897	+ 46.6%
Total # of Farms	366 110	229 373	- 37.3 %
Total Farm Area ('000 ha)	68 661	67 587	- 1.6%
Land in Crops ('000 ha)	27 828	35 912	+ 29.0%
British Columbia			
Population	2 184 621	4 113 487	+ 88.3%
Total # of Farms	18 400	19 844	+ 7.8%
Total Farm Area ('000 ha)	2 357	2 835	+ 20.3%
Land in Crops ('000 ha)	442	586	+ 32.6%

Source: Statistics Canada, Census of Agriculture

While BC is not losing farms and farmers in the same way as the rest of Canada (see Table 1), there are concerns that the long-term sustainability of productive agriculture is threatened by high land prices and associated development pressure. Urban development, environmental threats (pollution, salinity), and increasing numbers of rural estates or hobby farms continue to reduce farmland productivity near urban areas. Farm product prices, marketing and labour and input availability also pose challenges to agricultural viability at the urban fringe. Public interest in

agricultural land and its productivity is also impacted by recently heightened awareness and appeal for local food production, especially as it affects climate change and healthy eating.

2.0 Rationale and Research Objectives

Since agriculturally productive land is the largest capital investment for most farms in BC, land prices are a key determinant of farm survival and profitability. Using a regression model that identified significant factors influencing the price of farmland, we explored the effectiveness of the ALR and other agricultural land protection measures, with southern Vancouver Island as our case study. We hypothesize that, if zoning is credible, farmland prices adjacent to the urban edges should be lower due to the reduced productivity associated with negative urban externalities (Nelson 1992). Alternatively, if landowners do not believe agricultural protection is permanent, these lands will have higher values than land further from the urban edge in expectation that it will be sold to developers in the future.

The objective of this research was to determine the relative impacts of policy, agricultural, and urban factors on farmland prices at the urban fringe. A related goal was to inform local, provincial and federal policies that endeavour to impact local agricultural production in ways that best reflect public interests and values.

3.0 Research Methods

We acquired spatial, land use and land value data on all agricultural and neighbouring parcels of land on the Saanich Peninsula on Vancouver Island. Data were primarily obtained from the BC Ministry of Agriculture and Lands (BC MAL), the BC Assessment Authority, the Capital Regional District, and LandCor Data Corporation.

Properties with agricultural use class in our data set had a median 2006 assessed land value of less than \$3700/ha. This is much lower than sale prices (five-year average) of vacant land (no buildings), which were \$261,000/ha for a 2 ha parcel (prices for 0.8 and 4.0 ha parcels were \$505,000/ha and \$149,000/ha, respectively). Because of the vast difference between assessed and sales values for farmland, our study could only utilize actual sales to study price impacts of the ALR and spatial and other factors. We use 893 observations of farmland parcel sales in the period 1974 to 2006. Sales that incorporated more than one parcel were excluded, and parcels were only selected if they could be linked to all fifteen datasets and if their actual use was agricultural as designated by BC Assessment.

The regression model uses the per hectare market value of land as the dependent variable; the covariates include parcel size, farm type, topographical features, a fragmentation index, distance to Victoria, and whether or not the parcel is within the ALR. All values were converted to 2006 dollars, and other time-related price fluctuations are addressed by including indicator variables for each year. Improved model fit was also achieved by incorporating variables relating to cash/non-cash sales, multiple sales of the same property, jurisdiction, and interaction between time and ALR.

4.0 Results and Discussion

The means of price and size are skewed because the data set includes some smaller properties with very high values and other properties much larger than the average size. Therefore, the typical lot size chosen for reporting purposes is the median of 2.0 ha, rather than the mean of 3.5 ha. Lot sizes in the figures below range from 0.8 ha to 10.0 ha, inclusive of 90% of the property sizes in the dataset (5% were smaller, and 5% were larger).

For an average sized lot (2.0 ha), farmland price increased from \$119,000/ha (\$48,300/acre) in 1974-78 to \$294,000/ha (\$119,000/acre) in 2002-06. The prices varied widely by year, and to account for anomalies, a moving five-year average is used for display in Figure 1. This means the data are smoothed out, allowing trends to be more easily recognized. A sharp rise in real-estate values in 2006 resulted in a price increase to \$407,000/ha, 35% higher than the 2005 average. Because the price impacts of different factors are reported in relation to this very high value, effects are also indicated as a percentage of the average price. The majority (72%) of properties were in the ALR and 38% were within 10 m of the ALR boundary. The mean elevation was 67 m

above sea level, and the mean change in elevation on a parcel of land was 5.8 m/ha. Selected summary statistics are provided in Appendix A.

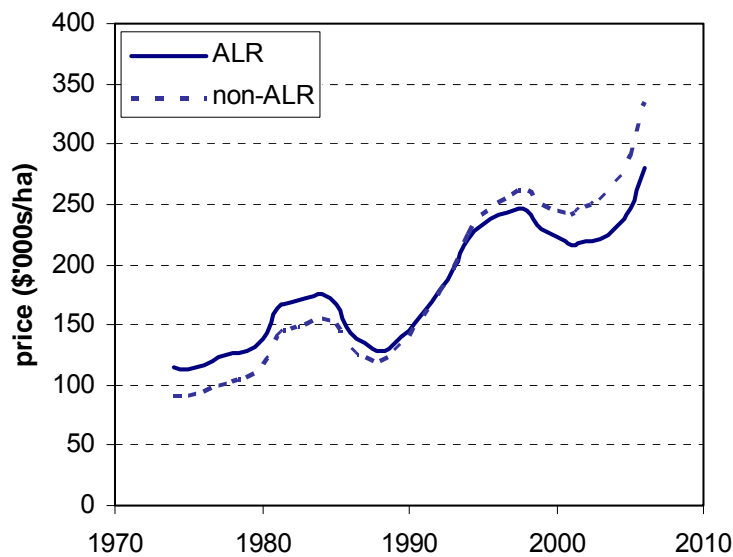


Figure 1. Saanich Peninsula farmland prices for average size lot (2 ha), 1974-2006, moving 5-year average, based on model of all farm property sales

Table 1. Significant factors affecting farmland prices on Saanich Peninsula, 1974-2006

Factor	Statistical Significance ^a	Description ^b
parcel size	***	The value of land decreased rapidly with an increase in parcel size (see Figure 2).
ALR	***	While ALR initially had a positive impact on prices (+\$23,000/ha in 1974), ALR land was worth \$86,000/ha less (18% of non-ALR price) in 2006 (see Figure 1).
Distance from ALR boundary	***	Land situated 1.5 km from the ALR boundary (within the ALR) was worth \$92,000/ha (25%) more than land next to the boundary
Fragmentation index	**	Entirely isolated parcels were worth up to \$126,000/ha (31%) less than one within a large block of farm land.
Vacant land	***	The absence of buildings decreased value by \$176,000/ha (40%) (see Figure 2).
Farm type	Varies, see description	Horses: ↑ by 8.9% (p<0.01) Vegetable: ↓ by 13.8% (p<0.01) Other livestock ↑ by 7.2% (p<0.10) Direct marketing ↑ by 8.7% (p<0.10)
Distance to Victoria	**	Parcels furthest from city centre (30.5 km) were worth \$58,000/ha (14%) less than those nearest (5.1 km) Victoria.
Distance to main highway	*	A land parcel 5.1 km from Hwy 17 was worth \$47,000/ha (12%) more than one next to the highway. ^c
Maximum elevation	***	Parcels at the highest elevation (180 m) were worth \$113,000/ha (31%) more than the lowest (5 m).

^a * p<0.10; ** p<0.05; *** p<0.01

^b The impact of each factor is measured for a lot of 2.0 ha in size, in 2006, unless otherwise indicated, with all other factors held at the mean.

^c 99% of all properties were within 5.1 km of the main highway.

All factors with a significant price impact are summarized in Table 1. As would be expected in a market with high demand for residential properties, lot size significantly impacted price per ha, with smaller lots being worth much more per unit area (Figure 2). For typical properties in the 0.8 to 4 ha size range, a parcel of vacant land – that without buildings – was worth between \$270,000 and \$430,000 less, similar to typical building replacement costs. Fragmentation of farmland outside of an agricultural block reduced land value. This is likely related to negative externalities arising from proximity to urban neighbours and the positive impacts of being surrounded by farming neighbours.

Inclusion in the ALR initially resulted in higher land prices, 24% more than non-ALR in the mid-1970s for an average size parcel, but by 2004-2006 land in the ALR was worth 17% less than non-ALR land (see Figure 1). This could be due to agricultural potential driving initial prices, with residential and development potential a stronger factor 30 years later. Distance to the ALR boundary had a large impact on land values, with values increasing with further distance from the boundary (and thus further distance from urban pressures and negative spill-overs). This accents the importance of both urban/rural fringe management and the protection of agricultural land within larger blocks.

Four different farm types as indicated by the Land Use Inventory (LUI) had a significant impact on farmland prices. The presence of horses, other livestock (non-cattle, poultry, or horses) and direct farm marketing increased land prices, and vegetable farms exhibited lower prices than others. Other farm types tested (cattle, poultry, forage, tree fruit/berries, vineyards and nursery/greenhouse) had no significant price impacts.

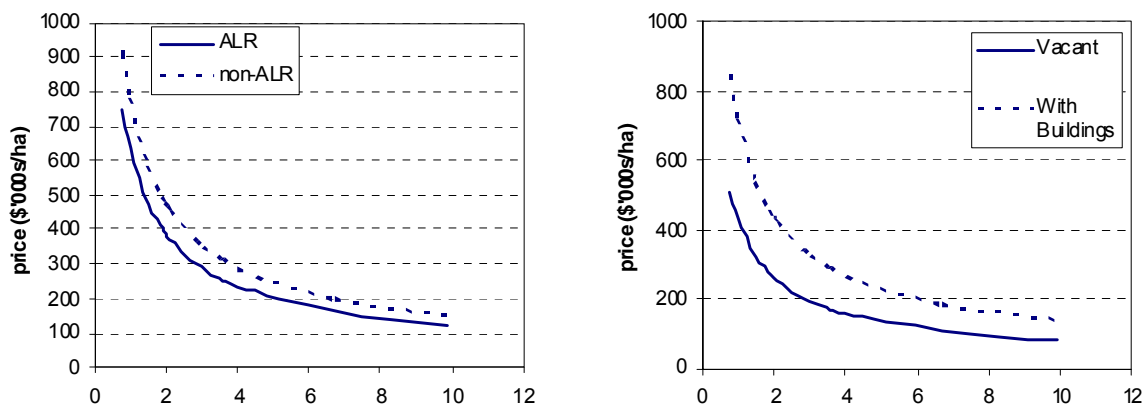


Figure 2. Impact of parcel size, ALR, and presence of buildings on farmland, Saanich Peninsula, 2006

Elevation and proximity to the city centre and the main highway also played a role in determining farmland prices, all in the direction expected if non-agricultural reasons impact the price. Higher elevation corresponded with higher land value, perhaps due to ocean or pastoral/open space views. Although land closer to the city was worth more, proximity to the main highway had the opposite impact. This is perhaps related to a desire by farmers and others to locate farther from noise and traffic and deeper within the rural area (peace and quiet atmosphere), but still maintain the convenience of close proximity to the city for either commuting or agricultural marketing reasons.

Assuming 2007 tax rates and that the five-year average sale price is similar to assessed land value for non-farm-class properties, typical tax savings with farm-class status can be calculated. Residential tax rates on the Peninsula range from 3.7 to 6.1% (of full market-assessed value) and agricultural tax rates range from 8.9 to 12.9% (of the much lower agricultural assessed value),

resulting in an agricultural classification tax savings in the range of \$7000 to \$11,000 per hectare depending on the municipality.

5.0 Conclusions and Policy Significance

Farmland in general is priced much higher than would be justified by farm income returns alone.¹ Although there is evidence of decreased land prices with farmland protection efforts such as the ALR, real-estate speculation and non-agricultural factors still play a role in land price determination. These factors lower agricultural productivity by reducing the ability of new farmers to enter the land market or that of existing farmers to expand their operations. Banks or other investors cooperating with farmers also desire returns equal to business market potential on a capital investment.

One issue regarding government involvement in the protection of agricultural land is the determination of the associated public or non-market values. With some differing results, policies could attempt to encourage productive agriculture, environmental conservation or preservation of open space. For example, tax breaks on agricultural land have been used in BC to retain land in active agriculture, but the low farm income threshold may result in underproductive land. However, it can be argued that this land provides open space (a public good) and ensures for future agricultural use and thus protection from current development threats.

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¹ For 2006, annual farmland rental rates in the region range between \$440 and \$2450/ha (\$200-1000/acre), which would correspond to a 4.5% rate of return on land worth between \$10,000 and \$54,000 per ha (compared with the actual price of \$261,000/ha for a vacant 2 ha lot, in our model). Some of the return on the capital investment must then come from expected increases in real estate value (capital gains).

Appendix A: Summary statistics of variables included in pricing model (n=893)

Variables	Mean	St. Dev.	Min	Max	Median
Sale price per ha in 2006 \$'000s	198.5	155.4	9.7	1 312	159.2
Lot size (ha)	3.5	4.3	0.16	40.0	2.0
ALR (% of all properties)	72.3	--	--	--	--
Distance to ALR boundary for parcels within the ALR (km)	0.22	0.28	0.0	1.49	--
Fragmentation index (proportion of perimeter bordering other farmland × size of total farm block of all adjacent farmland) (ha ⁻¹)	3.4	4.1	0	35.6	2.4
Distance to Victoria City Hall (km)	15.4	5.8	5.1	30.1	--
Nearest distance to Patricia Bay highway (km)	1.4	1.4	0.0	5.3	--
Maximum elevation in meters (m)	67	33	5	180	--
Difference between maximum and minimum elevation levels (Δ m/ha)	5.8	6.0	0	36.1	--
Vacant land (% of all properties)	13.7	--	--	--	--
Farm Types	(% of all properties) ^a				
Horses	25.0	--	--	--	--
Poultry	8.0	--	--	--	--
Cattle (beef or dairy)	3.4	--	--	--	--
Other Livestock	13.3	--	--	--	--
Forage	20.9	--	--	--	--
Vegetable	9.5	--	--	--	--
Treefruit & berries	8.8	--	--	--	--
Vineyard	3.4	--	--	--	--
Nursery/Greenhouse	8.3	--	--	--	--
Direct Marketing (Agri-tourism, Direct farm marketing, B& B)	8.0	--	--	--	--

^a Note that any one property can be defined as having up to four different farm types so the total may not add up to 100%.



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