

PROFITABILITY OF VEGETABLES, POTATOES AND FRUIT

FINAL REPORT

PREPARED FOR
ALBERTA AGRICULTURE AND RURAL DEVELOPMENT
ECONOMICS AND COMPETITIVENESS DIVISION
EDMONTON, ALBERTA

PREPARED BY
SERECON MANAGEMENT CONSULTING INC.
EDMONTON, ALBERTA

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Finally, we would also like to thank the fruit, vegetable and potato growers that were willing to talk with the consulting team and provide data and insights. The context they provided was a critical element to the success of this project.

EXECUTIVE SUMMARY

The study assesses the profitability of Alberta's commercial fresh vegetable, table potato and fruit industries through a cost of production analysis of primary production. As a secondary purpose, it also analyzes barriers and drivers to commercial industry expansion. The focus of this study was exclusively on the fresh produce of commercial growers (as distinct from produce grown by smaller producers for sale through farm direct marketing).

The profitability of commercial production was examined in three Alberta industry segments—vegetables, table potatoes, and fruit. Each of these segments was found to have unique challenges and opportunities. Likewise, the costs of production and income potential varied greatly, both between these three subsectors and within each segment.

Based on Statistics Canada data, the report provides an industry profile for all three of the relevant industry subsectors. Historical information is presented for Alberta production patterns. The report also provides an overview of distribution channels and trade patterns. Despite overall increases in consumption of fresh vegetables and fruits, a review of Canadian patterns showed that consumption of many of the products grown commercially in Alberta (beans, corn, peas, and onions) is on the decline.

The Alberta commercial vegetable industry (excluding potatoes) has not increased significantly over the past decade. Many of the vegetable processors work on a small profit margin, and are not in a position to invest in equipment and technology to expand. A total of eight competitive issues appear to be impacting the reality faced by the sector (both primary and processing). This report examined the following factors and how they affect the industry's ability to compete: import competition, food trends, climate, labour, storage capacity, innovation support, industry organizational structure, and branding.

Cost of Production estimates were difficult to obtain due to low response to request for field interviews of commercial growers. A revised approach was therefore used, with the following sources as the basis: cost of production data obtained for direct-market production in Alberta, cost of production estimates from other jurisdictions, contact and discussion with agronomists, and a benchmarking workshop. The consulting team worked closely with ARD to review the various data sources in the context of commercial production in Alberta, enabling the development of a partial set of benchmarks.

Cost of production budgets (including detail breakdowns of fixed and variable costs) were established for the following crops: sweet corn, cucumber, fresh table potato, dryland carrot, irrigated carrot. The contribution margin for these crops ranged from a low of \$679 for non-irrigated carrot to a high of \$1,711 for sweet corn. While not as robust as summary statistics from a large sample of growers might have been, they do represent a relatively solid range of potential returns for the crops where information could be obtained.

A number of findings and recommendations for next steps stemmed from the poor response to the field interviewing process. The current stakeholders in the sector have come through a tough decade of industry consolidation and occasionally failed cooperation. This reality has had a significant impact on the willingness of growers to participate in developing industry wide benchmarks. The findings suggest that perhaps ARD efforts may best be focused on a sector of the industry with more participants or new entrants, while also working to engage the commercial fruit and vegetable industries when designing industry support mechanisms.

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INTRODUCTION

The purpose of the study is to “*assess the profitability of Alberta’s commercial vegetable, potato and fruit industries through a cost of production (COP) analysis of primary production*”. While of secondary importance for the purpose of the study, we have also provided a discussion of the current processing industry in Alberta and an evaluation of the barriers and drivers to industry expansion.

This report focuses on the current structure of the industry, an assessment of the potential for industry expansion, and factors that limit the scale of expansion. This report provides the cost of production (COP) data obtained for selected vegetables and table potatoes, as well as a ‘next steps’ section.

It is recognized that while vegetables in Alberta are produced both as field crops and under greenhouse production that the focus of the primary Cost of Production (COP) analysis is exclusively on the fresh field vegetable sector.

For this study, a variety of approaches were used to support the industry analysis and evaluation. In addition to the use of a number of secondary research sources, a range of industry analyses and consultations were undertaken.¹ It is important to note that secondary data is limited, as the available data often does not break out Alberta specific data. It is also rarely broken out for the processing and fresh market sectors. In some cases, available data is not current. The statistical review focuses on field crop production only and excludes greenhouse production.

PROJECT SCOPE

This study attempts to summarize the profitability of commercial producers in three industry segments in Alberta – vegetables, potatoes, and fruit. Each of these segments has very unique challenges and opportunities. Likewise, the costs of production and income potential vary greatly; not just between the main segments but also within each segment.

The delineation of industry sectors often becomes blurry in an industry where vertical and horizontal integration are commonplace and system participants often play multiple roles. However, it was felt that the following industry categorizations would allow this study to strike the best balance between detail and accuracy:

Following discussions and input from five vegetable and potato industry staff from Alberta Agriculture and Rural Development (ARD), it was acknowledged that there is some overlap in the activities undertaken by a producer, a processor, a shipper, a packager, or a distributor in these industry sectors.

Since there is significant integration within the industry, many entities in the vegetable industry are not confined to just one of these roles. However, clarity on the various industry elements and accuracy of labelling individual entities will be important to make this report most useful and credible.

Commercial vs. Direct Market

The project team working on this study focussed on determining the cost of production for commercial operations. It is important to note that ARD staff are working on a related study of the cost of production for farm direct market fruits and vegetables. As part of our analysis of the cost of production within the commercial sector, the study period was extended across three years, in an effort to obtain representative data that was not

¹ Part of the industry analysis was led by Al Stuart and his involvement and consultation with different industry players, mainly focused within the vegetable processing and marketing sector. Mr. Stuart is a long term vegetable industry analyst and consultant, and is the Vice President of Marketing and Development with Bassano Vegetable Growers.

unduly influenced by anomalies within one production year. The benefits of a longer term approach with the commercial sector are discussed in detail later in this report.

As with the definition of producer and processor, there are some areas where it will be unclear which producer types should be included in each of the studies. This is especially the case for some producers, who may grow a substantial portion of their crop under contract, yet dedicate another substantial acreage to crops for direct-marketing through other markets.

The following have been used as thresholds to define commercial production for the primary cost of production analysis:

- ➔ Vegetables greater than \$100,000 annual farm gate sales.
Excludes greenhouse vegetables and dried peas, beans and lentils.
- ➔ Potatoes greater than \$100,000 annual farm gate sales.
The primary (COP) data collection for this study focuses on table potatoes only because the processing sector conducts their own COP analysis.
- ➔ Fruit greater than 10 acres annual production

Glossary²

Benchmark: A benchmark is a value that is used as a point of reference for a measurement. In the case of cost of production benchmarks in this study, they are an average regional value that can be used as a way for individual growers to assess their costs against average costs or to estimate the costs of a potential new crop for their operation.

Census Farm: an agricultural operation that produces at least one of the following products intended for sale: crops (hay, field crops, tree fruits or nuts, berries or grapes, vegetables, seed); livestock (cattle, pigs, sheep, horses, game animals, other livestock); poultry (hens, chickens, turkeys, chicks, game birds, other poultry); animal products (milk or cream, eggs, wool, furs, meat); or other agricultural products (Christmas trees, greenhouse or nursery products, mushrooms, sod, honey, maple syrup products). (Statistics Canada).

Commercial producers: larger scale producers (see thresholds used in this study in the previous section). Commercial producers typically market through intermediary distribution channels (packers, processors, retailers, food service, distributor/wholesalers). Commercial operators may grow under contract.

Contribution margin: Contribution margin is the difference between the sales price or gross revenue for a crop and the total variable costs incurred by that crop. It measures the contribution by that particular crop to covering the overall fixed costs of operation of the farm.

Distributor/wholesaler: Typically defined as an intermediary between the producer, packer and/or processor and the retailer, food service establishment or consumer. Lines are often blurred – for example a processor may purchase some ingredients from a wholesaler or packer, perform a value-added process, and sell to another wholesaler.

Farm Cash Receipts: represent the cash income received from the sale of agricultural commodities as well as direct program payments made to support or subsidize the agriculture sector. (Statistics Canada).

² Terms defined by Statistics Canada are identified as such. Definitions for other terms were created by the consultants for the purpose of clarity in this report.

Farm Direct: Produce marketed directly by the farmer to the consumer. Examples include U-pick operations, roadside stands, on-farm retail outlets and producer operated farmers market stands. May include value added and prepared products (e.g. frozen, preserves, pies etc.).

Farm Gate (or Market) Value: represents production values expressed as remuneration obtained at the “Farm Gate” and are related to gross returns to growers. This does not include program payments or other support payments made to producers. (Statistics Canada).

Farm Type: Farm typing is a procedure that classifies each census farm according to the predominant type of production. This is done by estimating the potential receipts from the inventories of crops and livestock reported on the questionnaire and determining the product or group of products that make up the majority of the estimated receipts. (Statistics Canada).

Fixed cost: Fixed costs are costs that will not change with production levels or cropping decisions. Examples of fixed costs include machinery depreciation, building insurance, and land rent.

Field Vegetables: The production and supply of vegetables (edible plants or roots) grown in an open (field) area or under growth-enhancement techniques (including high tunnels and row covers). Excludes potatoes and vegetables grown in greenhouses. Previously referred to as “other vegetables” by Statistics Canada.

Fresh Market: Produce that is marketed in its perishable state and has not been processed. It may be sold in bulk (unpackaged), in bags, boxes, shrink wrapped or in other packaging. Fresh market produce may be washed and trimmed to prepare it for market. Minimal preservation (such as wax spray) may be applied, but no value-added processing occurs. Fresh market produce is sold by the producer directly to the consumer (farm direct), direct to a retailer or food service establishment, to a packer, or to a wholesaler/distributor.

Greenhouse: an operation where plants are grown under glass, plastic or similar type of protection. (Statistics Canada).

Packer: May be the producer, a farmers’ cooperative, an independent company or other organizational structure that grades, cleans, chills and/or packs produce for the fresh market.

Processing/Process: Produce that, when grown, is intended for the processing market. Potatoes, vegetables and fruit are transformed into a value-added product through physical, chemical or thermal processing means. Examples include perishable fresh-cuts, sliced, diced, and peeled pot-ready produce, as well as frozen, canned, dried, pickled, or otherwise processed or preserved produce including pulp, pastes, purees, sauces, and juices.

Processor: May be the producer, a farmers’ cooperative, an independent company or other organizational structure that transforms produce into a value-added product through physical, chemical or thermal processing means.

Process Potatoes: Potatoes grown for the processing market. See also the definition of “Processing/Process”.

Produce: For the purposes of this study, produce is used as a generic term to refer to the vegetables, potatoes and fruits considered in the analysis.

Small Fruits: Includes grapes, blueberries, strawberries, and other berries (Statistics Canada).

Seed Potatoes: Potatoes grown and marketed for the purpose of growing potato plants.

Table Potatoes: Potatoes grown for the fresh market (not for processing or as seed). Table potatoes are typically marketed in bulk or bagged form.

(Under) Contract: Produce grown under contract to a processor or other market intermediary. Examples of typical contract terms include provision for variety, seeded acres, quantity, price, grade (size and quality), delivery, and organic production methods.

Variable cost: Variable costs are all costs that will increase with greater production of a crop. Examples of variable costs include direct crop inputs like seed and fertilizer, but also some less direct costs such as operating interest or utilities.

INDUSTRY PROFILE

POTATO, VEGETABLE AND FRUIT PRODUCTION

Total farm cash receipts in Alberta topped \$10.5 billion in 2011, 21% of Canada's cash receipts from this sector. Alberta's primary agriculture sector has grown by 21% over 2007. Crop receipts represented half of the value of total agricultural production in 2011 (both in Alberta and Canada as a whole). (Source: Statistics Canada CANSIM Table 002-0001)

On average, potato, vegetable and strawberry receipts represented 4% of the total crop receipts in the Alberta between 2007 and 2011 (9% all of Canada). Collectively, Alberta receipts from these three crops grew by 8% during this period, below the provincial average growth rate for all agriculture, and below the comparable Canada wide rate of growth (18%).

Alberta crop receipts totaled approximately \$153 million for potatoes (15% of Canada's production), \$30 million for field vegetables (3% of Canada's production) and \$1.4 million for small fruits which includes \$ 0.6 million for strawberries (<1% of Canada's small fruit production) in 2011. Table 1 provides an overview of the structure of these segments of the industry, from the perspective of number of producers, acres under production in Alberta and in comparison to the Canadian industry.

Table 1: Alberta and Canada Vegetable, Fruit and Potato Industry Structure 2006³

Vegetables	Canada		Alberta		Alberta % of Canada		Average Size	
	# Producers	Acres	# Producers	Acres	# Producers	Acres	Canada	Alberta
Beans	2,437	27,176	189	247	8%	1%	11	1
Cabbage	1,507	10,702	128	372	8%	3%	7	3
Carrots	2,303	24,356	244	1,003	11%	4%	11	4
Corn Sweet	3,383	74,698	196	4,582	6%	6%	22	23
Cucumbers	2,447	7,173	189	146	8%	2%	3	1
Onions	1,743	14,389	163	987	9%	7%	8	6
Peas Green	1,972	41,590	220	4,101	11%	10%	21	19
Cauliflower	959	5,298	91	177	9%	3%	6	2
Potatoes	3,667	401,583	402	54,759	11%	14%	110	136
Fruit								
Strawberries	2,479	12,861	184	317	7%	2%	5	2
Saskatoons	897	3,223	394	1,587	44%	49%	4	4
Raspberries	2,559	8,982	207	239	8%	3%	4	1

Source: Statistics Canada, Agricultural Census, 2006, 95-629-XWF

Fruit acres are cultivated acres, not bearing acres

In 2006, Alberta had from 6 to 11% of the Canadian producers of vegetables, depending on the crop. Of the area under production, Alberta represented up to 10%. The average size of vegetable operations per producer varied from a few acres for some crops, to 19 and 23 acres for fresh pea and sweet corn producers, respectively.

Alberta represented a much greater proportion of Canada's potato production and producers. The average potato operation in Alberta was 136 acres in 2006. As well, much of the production is under irrigation.

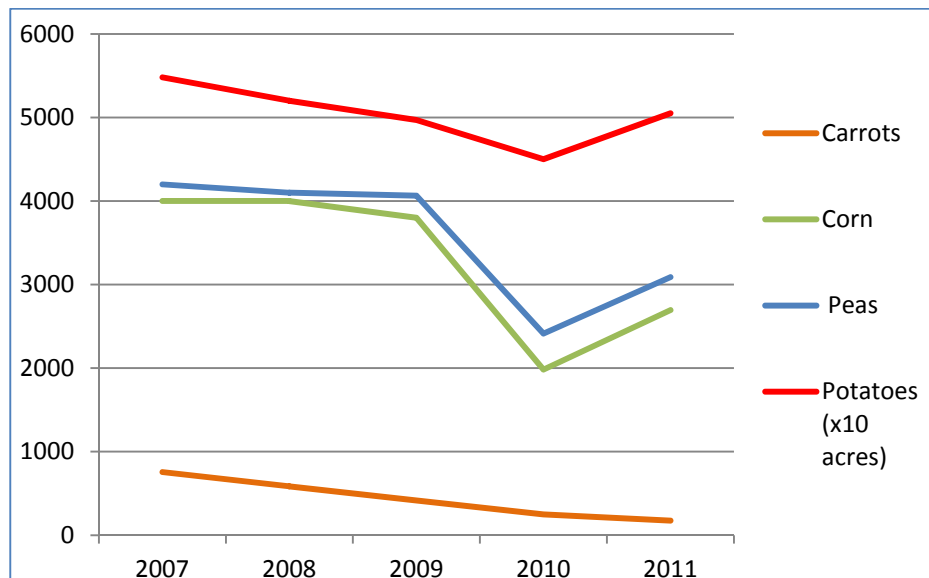
Alberta produces a significant amount of small fruits, in particular saskatoons. Forty-four percent of Canadian saskatoon producers, and almost one-half of the planted acres were in Alberta in 2006. Statistics are less available on black currant production. ARD estimates that 300-320 (cultivated) acres of black currants were grown in the province in 2011.

³ Farm and Operator Data from the 2011 Census of Agriculture will be released on May 10, 2012.

Production, Yield and Value of Potato, Vegetable and Fruit Crops

Production (measured in harvested acres) of Alberta potato and selected vegetable crops suitable for processing has been on the decline. Figure 1 also shows some variability in harvested acres from year to year. Variability of supply associated with a limited production area and therefore subject to weather conditions, presents a challenge in terms of establishing marketing channels with wholesalers, retail and processors.

Figure 1: Alberta Trends in Harvested Acres, Potatoes and Selected Vegetables



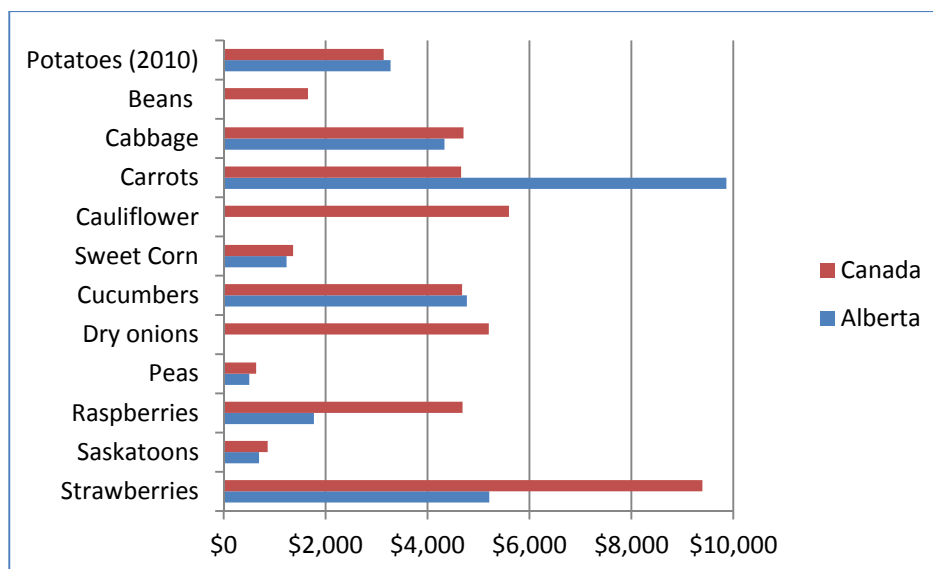
Source: CANSIM Tables 001-0013, 001-0014

Figure 2 summarizes comparative market value per harvested potato, vegetable or fruit bearing acre in 2011 (2010 for potatoes). Alberta's market value per acre for these crops was comparative to all of Canada except for carrots (Alberta was higher) and strawberries and raspberries (Alberta was lower). 2011 Alberta data was not available for green/wax beans, cauliflower, and dry onions.

One explanation for the higher value for carrots in Alberta relative to Canada could be differences in the proportion of baby carrots (that have a higher market value) or the proportion of all carrots sold to the fresh market (again at a higher market value) versus to the processing market. See Table 7 for comparative vegetable prices.

Lower raspberry and strawberry market value per bearing acre for Alberta vs. Canada is directly related to significantly lower yields per acre (see Table 4). Offsetting some of the yield disadvantage is a higher price per kilogram realized for Alberta berries because most of this produce is marketed farm direct.

Figure 2: Comparative Market Value per Harvested (Bearing) Acre 2011



Source: CANSIM Tables 001-0009, 001-0013, 001-0014

The following tables indicate area, yield, production and value for the crops under study for Canada, Alberta and Alberta as a percentage of Canada. In 2011, Alberta was very competitive in regard to potato and sweet corn yields per acre, relative to all of Canada, but fell behind on the other vegetable and fruit crops. For example, Table 3 shows that Alberta has 13% of the country's pea area but just 10% of Canada's production and value.

Potato Production

Table 2: Potato Area, Yield, Production, and Value (2010-2011)

	CANADA	ALBERTA	Alberta % of Canada
Harvested Areas (acres)			
2010	343,000	45,000	13%
2011	348,200	50,500	15%
Average yield, potatoes (hundredweight per harvested acres)			
2010	282.4	314.0	111%
2011	263.9	328.0	124%
Amount sold, consumed, seeded or fed to livestock, potatoes (hundredweight x 1,000)			
2010	92,977	13,778	15%
Farm Gate Value (\$1,000s)			
2010	1,076,261	147,400	14%

Source: CANSIM Table 001-0014

At the time of writing, 2011 sales and value for potatoes had not yet been published.

Vegetable Production

Vegetable producers vary dramatically in scale within the province. There are relatively few commercial producers and a large number of farm direct producers (e.g. small scale market garden operations which produce limited quantities of produce and market locally to farmers' markets and directly to other clients). Table 3 lists selected field vegetables that are grown commercially in Alberta; however the area, yields, production and value include both commercial and market direct values.

Table 3: Vegetable Area, Yield, Production, and Value 2011

	CANADA	ALBERTA	Alberta % of Canada
Harvested Area (acres)			
Beans Green or Wax	16,217	x	x
Cabbage	12,760	363 ^E	3%
Carrots	20,452	175	1%
Cauliflower	3,791	x	x
Corn, Sweet	44,191	2,694	6%
Cucumbers	4,417	48	1%
Dry onions	12,538	x	
Peas	23,442	3,089	13%
Average Yield per Acre (pounds)			
Beans Green or Wax	5,300	x	NA
Cabbage	28,100	15,100 ^E	54%
Carrots	45,400	17,900	39%
Cauliflower	16,000	x	NA
Corn, Sweet	9,100	10,400	114%
Cucumbers	19,900	3,600	18%
Dry onions	34,000	X	NA
Peas	3,500	2,700	77%
Marketed Production (tons)			
Beans Green or Wax	42,578	X	X
Cabbage	175,462	2,729 ^E	2%
Carrots	454,650	1,567	<1%
Cauliflower	30,349	X	X
Corn, Sweet	197,619	13,963	7%
Cucumbers	42,285	88	<1%
Dry onions	209,304	F	X
Peas	40,693	4,163	10%
Farm Gate Value (\$1,000s)			
Beans Green or Wax	26,823	x	X
Cabbage	60,046	1,572 ^E	3%
Carrots	95,260	1,726	2%
Cauliflower	21,217	x	X
Corn, Sweet	60,206	3,327	6%
Cucumbers	20,661	229	1%
Dry onions	65,234	F	X
Peas	14,930	1,551	10%

Source: CANSIM Table 001-0013

The major source of information is from the Fall Survey of Fruits and Vegetables, conducted by Statistics Canada. Vegetable and fruit data excludes Institutional farms, farms on Indian reservations, Hutterite colonies operations producing only potatoes or greenhouse vegetables and small operations with less than 1 acre of fruit and less than 1 acre of vegetables.

Symbol legend:

F Too unreliable to be published

E Use with caution

X Suppressed to meet the confidentiality requirements of the Statistics Act

Cabbage Includes Chinese cabbage and regular cabbage. Carrots includes baby carrots and regular carrots.

Fruit Production

According to Statistics Canada, Alberta has a very small fruit industry, most of which is farm direct (e.g. U-Pick, Farmers Markets and farm gate). Saskatoons are a significant crop, in that Alberta production represents half of that in Canada. Alberta strawberry and raspberry yields were significantly lower than yields in all of Canada in 2011, suggesting a competitive disadvantage unless economies of scale can be achieved.

Table 4: Fruit Area, Yield, Production, and Value: Selected Fruit Crops 2011

	CANADA	ALBERTA	Alberta % of Canada
Cultivated area (acres)			
Raspberries	6,674	180	3%
Saskatoons	2,592	1,500	58%
Strawberries	10,160	173	2%
Bearing Area (acres)			
Raspberries	6,073	92	2%
Saskatoons	1,405	700	50%
Strawberries	7,709	133	2%
Average Yield per Bearing Acre (pounds of marketed production)			
Raspberries	4460	783	18%
Saskatoons	484	400	83%
Strawberries	5894	1519	26%
Marketed Production (tons)			
Raspberries	13,542	36	<1%
Saskatoons	340	140	41%
Strawberries	22,717	101	<1%
Farm Gate Value (\$1,000s)			
Raspberries	28,460	163	1%
Saskatoons	1,212	485	40%
Strawberries	72,396	589	1%

Source: CANSIM Table 001-0009

The Saskatoon yields per acre in the table above may be understated, according to ARD. Yields from saskatoon bushes increase with age. For example, in a 2008 study on “Economics of Saskatoon Berry Production: A Ten Acre Enterprise” 573 pounds/bearing acre can be anticipated in year 4 (the first year to expect yields after planting), approximately 3,600 pounds/acre starting in year 7 and thereafter. 2000-4000 pounds per acre is considered a typical range.

Irrigation

Irrigated vegetable crops are concentrated in the southern part of Alberta, particularly around the Taber and Medicine Hat areas. Table 5 provides a snapshot of irrigated vegetable and fruit crop farms and acres. Potatoes are excluded from this table because data for irrigated potatoes is included with field crops. Historical comparisons are not possible because irrigated crops were new to the 2006 Census of Agriculture.

**Table 5: Irrigation for the calendar year prior to census year –
Irrigated vegetables and irrigated fruits, 2005**

	Canada		Alberta	
	Farms	Acres	Farms	Acres
Vegetables	3,092	107,566	189	9,420
Fruit	4,726	75,106	192	992

Source: Statistics Canada Table 4.12-3 2006 Census of Agriculture

Table 6 details the area of specific crops considered in this report that were produced under irrigation in Alberta in 2010. Collectively, these crops made up 3% of the total 1.36 million irrigated acres in the province in that year.

Table 6: Irrigated Acres of Selected Crops in Alberta in 2010

Crop	Acres
Carrots	325
Fresh Corn Sweet	3,345
Fresh Peas	2,268
Onions	914
Potatoes	36,367
Seed potatoes	511
Small Fruit	289

Source: Alberta Irrigation Information, Facts and Figures for the Year 2010, Water Resources Branch. Irrigation and Farm Water Division, June 2011.

In “A Snapshot of the Canadian Vegetable Industry, 2010” prepared by Agriculture and Agri-Food Canada reported that: *“Due to environmental and economic pressures, vegetable producers face water restrictions from water regulators. Increasingly, producers are seeing security of water as something that impacts their business viability. Secure water access is an important issue for the economic profitability of the sector. Water restrictions caused by changes in water supply may result in potential replanting cost and affect the predictability of fulfilling contractual obligations. Industry is responding to this challenge with collaborative projects such as the Leamington, Ontario Area Drip Irrigation project.”*

Expansion of commercial vegetable, potato and fruit crops in Alberta is dependent, in large part, on the expansion of total irrigation capacity in the province. There may be some opportunity to replace irrigated acreage in other, less profitable crops with more profitable potato, vegetable or fruit crops, if the economics are demonstrated. Investment in private irrigation is another possibility but this is dependent on securing an Alberta Water Licence for this purpose. Continued affordability of energy used to run the systems is a key condition to achieve expansion of irrigated acres for any crop.

Organic Production

Thirty-one Alberta farms produced certified organic fruits, vegetables or greenhouse products in 2006, a 48% increase over 2001. This increase was consistent with that experienced in the rest of Canada. (Source: Statistics Canada 2006 Census of Agriculture)

Fresh and Processing of Field Grown Vegetables Canada

The following information illustrates the distribution of the volume of field vegetable crops grown for each of the fresh and processing markets in Canada in 2010. (Source: AAFC A Snapshot of the Canadian Vegetable Industry, 2010 Statistics Canada (Fruit and Vegetable Production, 22-003-X).

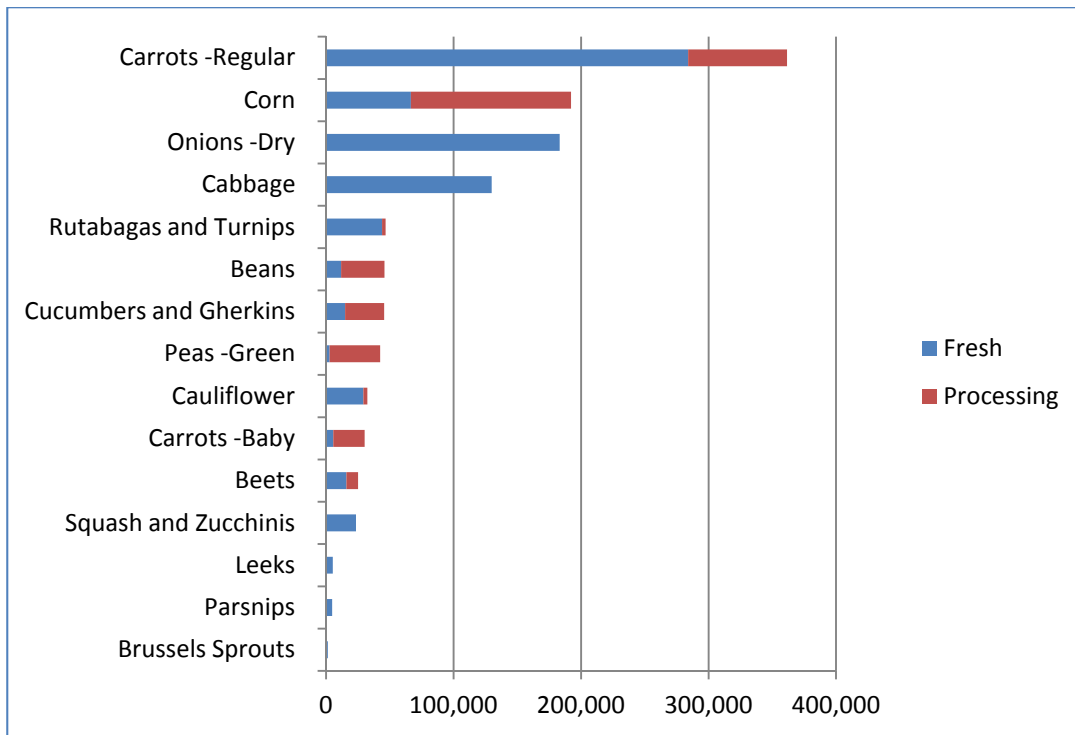
Overall, 1.09 million tonnes of fresh market field vegetables were produced in Canada in 2010, valued at nearly \$594 million. The selected crops (relevant to Alberta) illustrated in Figure 3 represented 75% of the total volume (0.82 million tonnes) and 62% of the value (\$367 million) with regular carrots, dry onions, and cabbage (including Chinese) being the most significant fresh market crops.

A total of 0.8 million tonnes of field vegetables for processing were produced in Canada in 2010, valued at \$128 million. The selected crops (relevant to Alberta) illustrated in Figure 3 represented 43% of the total volume (.35 million tonnes) and 48% of the value (\$62 million) with corn and regular carrots being the most significant processing crops.

The selected processing vegetables represented 29% of the total tonnes of fresh and processing field crops combined, and 14% of the combined value. In 2011, approximately 4,800 tonnes of processing peas and 13,400 tonnes of processing corn were produced.

Note: data for processing, both values and volumes, were not available for dry onions and cabbage (including green and Chinese cabbage). Regular (full-sized) carrots are distinguished from higher value baby carrots in this data. Beans include green and wax. Beans and peas are fresh; dry legumes are excluded.

Figure 3: Selected Vegetables - Fresh Market and Processing Volumes Canada (tonnes) 2010



Source: Statistics Canada



Table 7 illustrates the significant difference in value per kilogram for selected crops produced for the fresh market over the processing market. For example, the value of fresh market corn is 7 times that of sweet corn grown for processing. This data relates to Figure 3, therefore for consistency, the crops are presented in order of largest to smallest volume of production in Table 7.

Table 7: Comparative Value of Fresh Market versus Processing Field Crops Canada 2010 (\$/kg)

	Fresh	Processing
Carrots -Regular	0.28	0.12
Corn	0.71	0.10
Onions -Dry	0.39	NA
Cabbage	0.34	NA
Rutabagas and Turnips	0.42	0.18
Beans	1.77	0.29
Cucumbers and Gherkins	0.73	0.38
Peas -Green	1.60	0.28
Cauliflower	0.76	0.64
Carrots -Baby	0.83	0.08
Beets	0.52	0.17
Squash and Zucchini	0.83	NA
Leeks	1.38	NA
Parsnips	1.01	NA
Brussels Sprouts	1.54	NA

Source: Statistics Canada

Figure 4 shows trends in volume and value of selected field vegetables grown for both the fresh and processing markets in Canada. Only sweet corn, cauliflower, cucumbers, peas-green and beans were included in this chart, as they are the only vegetables for which the available data would allow comparison of fresh and processing values over five years. Processing volumes of these crops declined sharply during this period.

Figure 4 Trends in Fresh Market and Processing Field Vegetable Crops (Sweet Corn, Cauliflower, Cucumbers, Peas and Beans) Value (\$000) and Volume (tonnes) Canada - 2006-2010



Source: Statistics Canada

In “A Snapshot of the Canadian Vegetable Industry” prepared by Agriculture and Agri-Food Canada reported that “In 2010, the total area planted with vegetables destined for the processing market was reported at 35,063 hectares, a decline of 12.2% (from 39,936) hectares from 2009. Although most of the vegetables supplied to



processing plants come from Canada, imports of vegetables for processing are playing an increasing role due to price competitiveness and improvements to the quality and shelf life of foreign products.”

Alberta Potato and Vegetable Processing Production

Process, table and seed potato acreage as well as process vegetable acreage in Alberta is further broken down in Table 8.

Table 8: Alberta Potato and Processed Vegetable Acreage (Seeded Acres)

Year	Potatoes			Process Vegetables		
	Process	Fresh-Table	Seed	Carrots	Corn	Peas
1995	13,450	5,765	7,400	740	3,884	3,163
2000	32,563	4,331	12,037	854	2,577	2,563
2005	38,508	2,567	10,531	647	2,068	3,346
2006	36,428	1,615	11,878	817	3,055	4,675
2007	40,535	2,245	9,729	518	3,395	4,750
2008	38,860	2,535	8,082	50	2,804	4,317
2009	37,656	2,605	9,251	165	2,923	3,940
2010	35,500	2,500	9,500	325	2,288	2,913
2011	40,976	2,118	9,685	0	2,075	3,032

Potato data from Potato Growers of Alberta, excludes market gardens <5 acres.

Processed vegetable data from Alberta Vegetable Growers (Processing). Defined as fresh, canned or frozen vegetables for human consumption.

The majority (78%) of the potatoes acreage in 2011 was in processing potatoes, 4% in fresh table, and 18% in seed potatoes. Virtually all of the carrot acres in Alberta in 2010 went into processing, while 72% of the sweet corn and 91% of the pea acres went for processing. See definitional note to Table 3 regarding types of operations excluded.

Table 9: Harvest Summary Alberta Potatoes 2011

Grower	Acres Planted	Acres Harvested	Total Tons Produced
Processing	40,976	38,626	665,530
Seed	9,685	8,855	125,811
Fresh-Table	2,118	1,947	25,007
Total – Potatoes	52,778	49,427	816,348

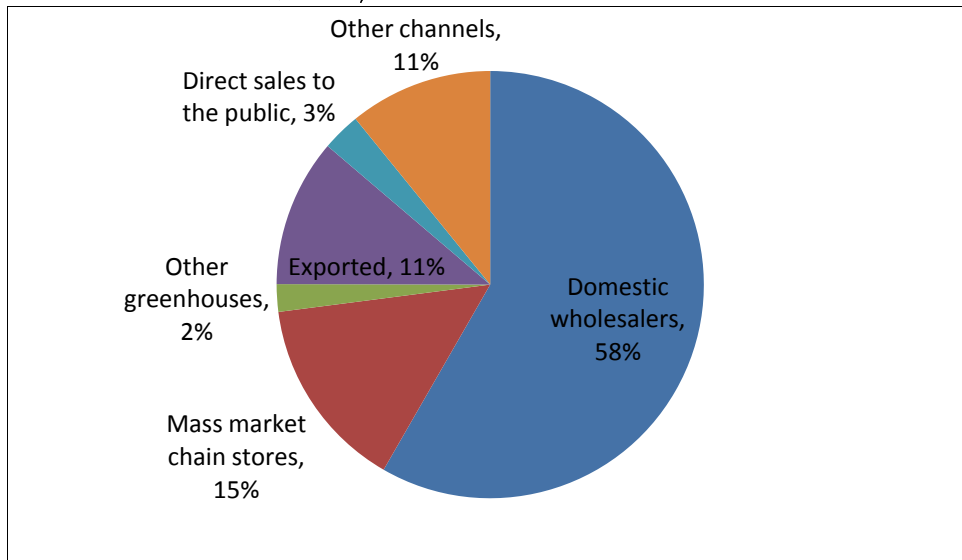
Source: Potato Growers of Alberta

DISTRIBUTION CHANNELS

Sales of produce in both Canada and Alberta are mainly through domestic wholesalers. Exports are an important channel for Canada as a whole, but negligible for Alberta. Direct sales to the public (including roadside stands and owner-operated retail outlets) are proportionally more important in Alberta than in Canada as a whole.

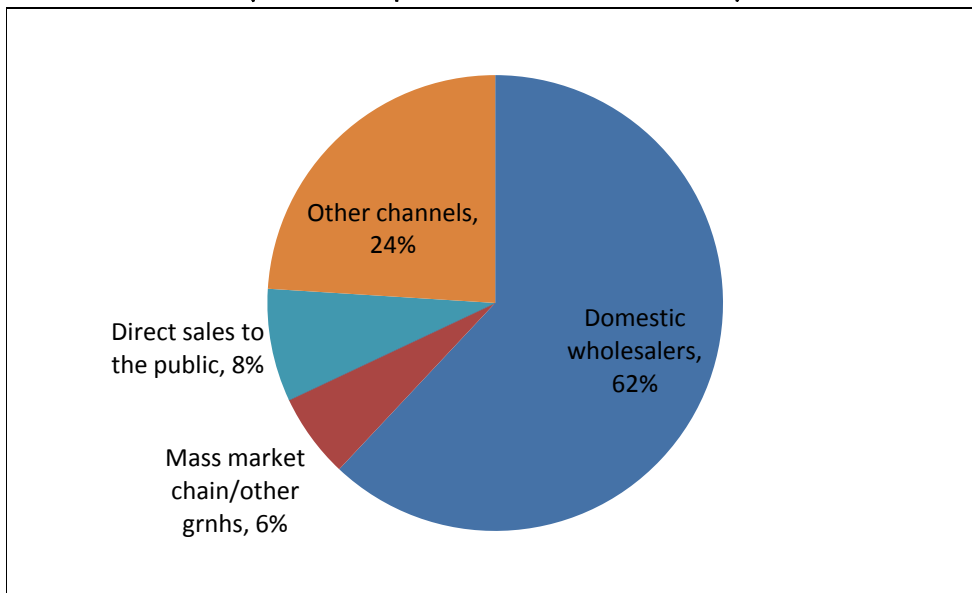
These charts (Figures 5 and 6) include sales of all fruits and vegetables (domestic and imports, field and greenhouse production) but exclude potatoes. Sales to “other greenhouses” are small and reflect inter-greenhouse transfer of produce. Some categories are grouped for Alberta because data is too unreliable to report for that category or has been suppressed to meet confidentiality requirements.

Figure 5: Channels of Distribution for Fruit and Vegetables Canada 2010
 (% of \$1,077 million in sales and resales)



Source: Statistics Canada. CANSIM Table 001-0050

Figure 6: Channels of Distribution for Fruit and Vegetables Alberta 2010
 (% of annual \$41.5 million in sales and resales)



Source: Statistics Canada. CANSIM Table 001-0050

TRADE IN VEGETABLES, POTATOES AND FRUIT

Trade statistics for vegetables, potatoes and fruit refer to exports and imports from other countries only. Interprovincial trade in these is not tracked. It is important to note that because Calgary Alberta is an important distribution hub for the grocery trade in western Canada, some produce entering Alberta at Canadian border points may be destined for markets in nearby provinces and not intended for consumption or further processing in this province.

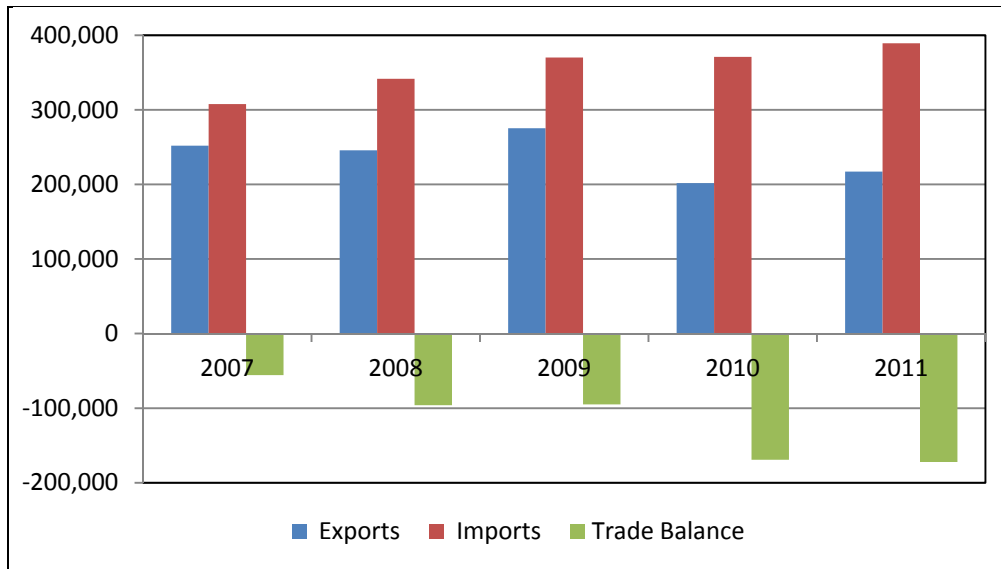
Despite the large land base, Alberta is a net importer of fresh vegetables and fruits, and a net exporter of processed potato products and seed potatoes. Due to obvious climatic limitations, fresh vegetable and fruit growers face relatively short production windows. The perishability of the product also restricts the marketing window for these crops.

Trade Balance

As shown in Figure 7, Alberta's trade deficit in fruits and vegetables has slowly grown over the past five years. In 2007, the trade deficit was in the range of \$56 million. By 2011, this trade deficit had grown to over \$172 million. Imports have grown from \$308 million in 2007 to \$389 million in 2011.

Trade deficit continues to increase.

Figure 7: Alberta Fruit and Vegetables Exports, Imports, Trade Balance (\$1,000)

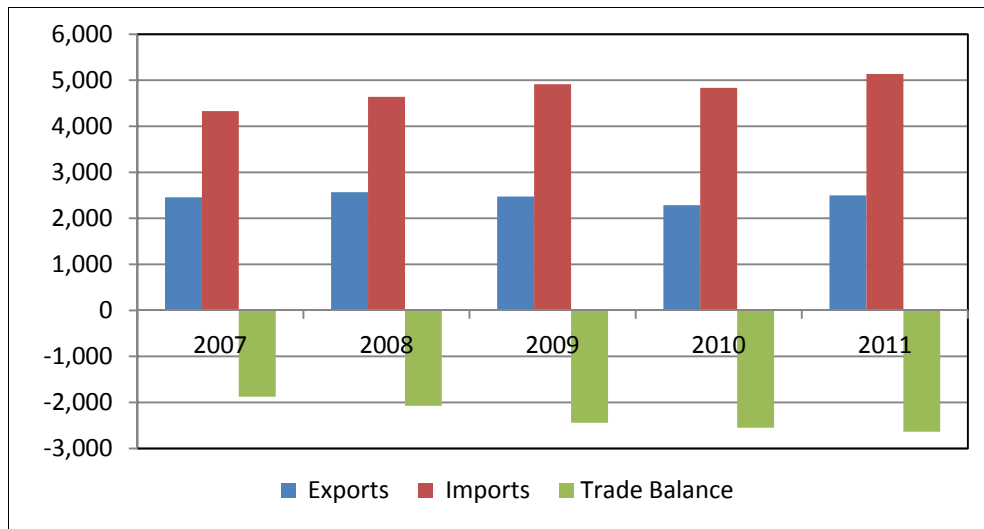


Source: Statistics Canada, Industry Canada, Trade Data on Line
 Based on following trade codes: NAICS 11219 - Other Vegetable (except Potato) and Melon Farming and NAICS 3114- Fruit and Vegetable Preserving and speciality food manufacturing.

Alberta's trade deficit in vegetables doubled between 2007 and 2011 while Canada's increased by 41%. The Canadian trade deficit in fresh and processed fruits reached \$2.7 billion in 2011 (Figure 8), following 5 years of steadily increasing imports and relative stability in the value of exports. The reasons for exports to be stable over the years could be the short growing seasons for fresh fruits and vegetables and the fact that Canada does not grow many of the tropical fruits and nuts and some vegetables increasingly being consumed. Therefore, the growth of imports is increasing.



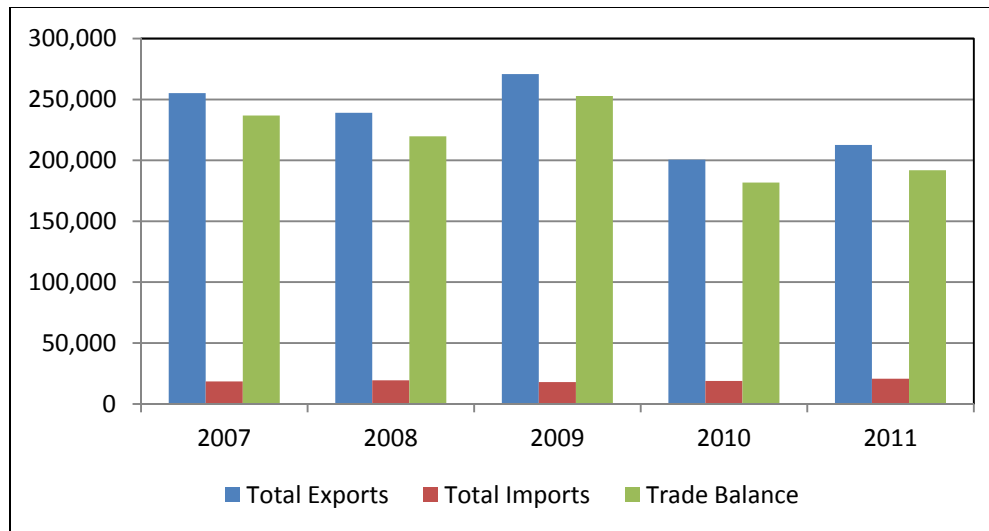
Figure 8: Canada Fruit and Vegetables Exports, Imports, Trade Balance (\$ millions)



Source: Statistics Canada, Industry Canada, Trade Data on Line
 Based on following trade codes: NAICS 111219 - Other Vegetable (except Potato) and Melon Farming and NAICS 3114- Fruit and Vegetable Preserving and speciality food manufacturing.

For many years, Alberta’s potato industry has seen a positive trade balance in the range \$200 million annually (Figure 9), primarily due to exports of processed potato products. Overall, Alberta’s exports of potatoes have been somewhat variable, having dropped \$70 millions from the previous year and increasing by \$12 million in 2011 due to fluctuations in production and the strong Canadian dollar.

Figure 9: Alberta Potato Exports, Imports, Trade Balance (\$1,000)



Source: Statistics Canada, Industry Canada, Trade Data on Line, HS 0701- Potatoes Fresh And chilled, HS 200410- potatoes, frozen- prepared/preserved without vinegar, HS 200520- Potatoes Frozen and HS 071210 – potatoes – dried but not further prepared.

The Alberta’s potato trade balance has followed a similar pattern to Canada’s over the past five years, as illustrated in Figure 10. Canada’s trade balance has declined by 10% since 2007 (it was \$771 million in 2011), while Alberta’s declined by 19% (it was \$192 million in 2011).



Figure 10: Canada Potato Exports, Imports, Trade Balance (\$ millions)



Source: Statistics Canada, Industry Canada, Trade Data On Line, HS 0701- Potatoes Fresh And chilled, HS 200410- potatoes, frozen- prepared/preserved without vinegar, HS 200520- Potatoes Frozen and HS 071210 – potatoes – dried but not further prepared.

Alberta Exports of Potatoes, Vegetables and Fruits

Table 10 on the next page details the value and volume of exports of Alberta potatoes, vegetables and fruits considered in this study for which trade data is available. Both 2010 and 2011 are shown because some crops had no exports for one of the two years. Overall, the table illustrates that the five year trend for these crops has either been variable or declining.

Table 10: Alberta Exports of Potatoes, Vegetables and Fruits 2010 and 2011

HS CODE	Description	Value CDN Dollars			Volume (Tonnes)	
		2010	2011	5 year trend	2010	2011
Fresh or Chilled Potatoes						
7011000	Potatoes seed	8,311,713	10,128,448	variable	24485.00	27574.00
7019000	Potatoes nes (ie Table)	459,509	791,389	variable	988.00	465.00
Frozen Potatoes						
7101000	Potatoes, frozen	276,218	10,996	variable	189.49	18.28
20041000	Potatoes prepared or preserved other than by vinegar or acetic acid, frozen	175,000,267	191,828,064	variable	167100.02	181085.69
Other Processed Potatoes						
20052000	Potatoes prepared or preserved, o/t by vinegar or acetic acid, not frozen	16,120,678	9,772,314	variable	6134.95	3964.81
Fresh or Chilled Vegetables						
7031000	Onions and shallots	9,959	0	-	19.28	0
7049000	Cabbages, kohlrabi, kale and sim edible brassicas nes	38	82	-	0.05	0.09
7061010	Carrots	368	148	-	0.87	0.35
7061020	Turnips	238	270	=	0.52	0.53
7070090	Cucumbers and gherkins, other than greenhouse nes	0	110,854	variable		112.48
7081000	Peas, shelled or unshelled	855,830	0	variable	1076.93	0
7082000	Beans, shelled or unshelled	380,830	0	variable	356.59	0
7099000	Vegetables nes	38,282	123,640	+	49.55	179.40
Frozen Vegetables						
7102100	Peas	1,799,079	1,876,247	variable	1225.94	1799.47
7102210	Beans, green and waxed	175,023	39,378	-	105.91	22.98
7102290	Beans, nes	158,641	56,074	-	65.12	27.25
7104000	Sweet corn	2,178,274	1,526,760	-	1521.70	1357.77
7108000	Vegetables, nes	1,120,924	391,620	variable	228.13	585.92
7109000	Mixtures of vegetables	2,141,384	177,659	variable	1302.30	112.98
Dried Vegetables						
7129000	Vegetables and mixtures dried, but not further prepared nes	3,000	5,397	+	1.50	0.06
Small Fruit						
8101000	Strawberries, fresh	18,232	0	variable	4.17	0
8109010	Black, white or red currants and gooseberries, fresh	3,754	0	NA	1.25	0
8112000	Raspberries, mulberries, etc, uncook, steam or boil in water, sweetened or not, frozen	0	83,666	variable	0	130.57

NES - Not Elsewhere Specified NA – not applicable, data reported for only one year

Source: Industry Canada

In summary, exports of the selected produce listed in Table 10 averaged: \$213 million (CDN) in 2010 and 2011, with:

- 86% from frozen potatoes,
- 6% from other processed potatoes (not frozen),
- 4% from fresh or chilled seed potatoes,
- 3% from frozen vegetables, and
- less than 1% each from fresh vegetables, dried vegetables and fruits

Trading Partners

The top trading partner for Alberta potatoes in 2011 was the United States⁴. The United States accounted for almost all (97%, \$20.1 million) of the value of Alberta potato imports and 69% (valued at \$147.1 million) of exports. Other important export destinations for Alberta potatoes were Japan (13%), Philippines (6%), Mexico (3%) and China (3%).

Table 11 illustrates Alberta's vegetable trading partners, value and main types of crops traded and how this has changed over the past 20 years.

Table 11: Imports and Exports to Alberta \$ Value

	Top 5 Countries	1990	2010	Vegetables
Exports From Alberta	United States	687,732	14,414,131	Peppers, Tomato Juice, Frozen Sweet Corn, Mixture of Frozen Vegetable, Frozen Peas, Peas
	Mexico	0	4,420,448	
	China	0	1,526,587	
	Japan	19,152	445,834	
	Greece	0	164,800	
	Other	587,241	450,732	
	Total	1,294,125	21,422,532	
Imports to Alberta	United States	47,410,739	202,734,035	Lettuce, Cabbages, Kohlrabi and Kale, Peppers, Cauliflower, Broccoli
	Mexico	10,809,668	71,581,012	
	Spain	929,400	2,804,019	
	Peru	42,224	1,544,073	
	China	84,528	1,194,108	
	Other	980,484	4,481,790	
	Total	60,257,043	284,339,037	

Source: Agriculture and Agri-Food Canada A Snapshot of the Canadian Vegetable Industry, 2010⁵

⁴Source: Statistics Canada, Industry Canada, Trade Data on Line, HS 0701- Potatoes Fresh And chilled, HS 200410- potatoes, frozen- prepared/preserved without vinegar, HS 200520- Potatoes Frozen and HS 071210 – potatoes – dried but not further prepared.

The top three suppliers of fruit to Alberta that export small fruits to Canada are detailed in Table 12.

Table 12: Top Suppliers of Canada's Fruit Imports (\$ millions)

Country	1990	2009	Leading product imports
United States	\$1,038.7	\$2,743.7	Strawberries (fresh), Orange Juice, Grapes, Orange (fresh), Cherries, Almonds, Grape wine (red).
Chile	\$114.8	\$452.7	Grapes, Grape Wine (red), Blueberries (fresh), Raspberries (frozen), Grapes (organic), Apples (gala), Grape wine (white).
Mexico	\$49.9	\$327.6	Avocados, Grapes, Raspberries and loganberries, Guavas, mangoes and mangosteens, Watermelon, Tequila, Strawberries, Limes.

Source: Agriculture and Agri-Food Canada: "A Snapshot of the Canadian Fruit Industry, 2009"

CONSUMPTION TRENDS AND OPPORTUNITY ASSESSMENT

CONSUMPTION: CANADA

Figure 11 shows a slight upward trend in Canadian consumption of fresh fruits and vegetables, and a moderate downward trend in fresh (table) potatoes. Processed vegetables (including frozen) is trending downwards. Although not illustrated in the figure, processed potatoes are increasing slightly. Also not illustrated, frozen fruit consumption (fresh equivalent weight) is on the upswing but overall processed fruit is down. Crops illustrated are inclusive of all potato, vegetable and fruit types, whether grown in Canada or not.

Figure 11: Trends in Fruit and Vegetable Consumption in Canada
Kg per person per year



Source: Statistics Canada CANSIM Table 002-0019

Experimental, use with caution. The data have been adjusted for retail, household, cooking and plate loss

Processed fruits and vegetables are fresh equivalent weight

Fresh potato volume was calculated by subtracting Fresh vegetables (excluding potatoes) from fresh vegetables values

Table 13 provides more detail regarding Canadian consumption trends of potatoes, vegetables, and fruits that are grown commercially in Alberta. Consumption includes both domestic and imported production. Of note is that per capita consumption of many of the products grown commercially in Alberta is declining, most notably, beans, corn and peas (fresh and processed) as well as onions. This is despite overall increases in consumption of fresh vegetables and fruits as illustrated in Table 13. Clearly, consumers are turning to produce not traditionally grown in Alberta. Consumption of carrots and cole crops are on the rise. Fresh white potato consumption is down but processed potatoes are up slightly, due to gains in the chip and frozen categories.

**Table 13: Trends in Selected Fruit and Vegetable Consumption in Canada
(2010, kg per person per year, adjusted for retail, household, cooking and plate loss)**

Crops	kg per person	Change 2006-2010
Potatoes		
Potatoes white fresh and processed	26.7	-6%
Potatoes white fresh	13.57	-13%
Potatoes total processed	13.66	2%
Potato chips	3.20	6%
Potatoes frozen	6.98	6%
Potatoes other processed	3.47	-8%
Vegetables		
Beans green and wax fresh	0.55	-15%
Beans green and wax canned	0.82	-14%
Beans green and wax frozen	0.20	-20%
Cabbage fresh	2.97	8%
Carrots fresh	5.46	31%
Carrots canned	0.14	8%
Carrots frozen	1.03	3%
Cauliflower fresh	0.76	23%
Cauliflower frozen	0.10	0%
Corn fresh	0.72	-5%
Corn canned	0.78	-20%
Corn frozen	0.40	-34%
Cucumbers fresh	2.29	-15%
Onions and shallots fresh	4.12	-8%
Peas fresh	0.16	-24%
Peas canned	0.29	-22%
Peas frozen	0.58	-29%
Fruit		
Raspberries frozen	0.25	-16%
Strawberries fresh	2.30	17%
Strawberries frozen	0.57	9%
Other fresh berries	0.62	138%

Source: Statistics Canada CANSIM Table 002-0011

In “A Snapshot of the Canadian Fruit Industry, 2009”, Agriculture and Agri-food Canada identified that “The Canadian fruit industry, like many other sectors within the horticultural sector is faced with an increasingly competitive environment where it must continue to change and adapt in order to be sustainable. Over 80% of fruit consumption in Canada is in the fresh form. Although overall consumption of fresh and processed fruit has increased by 24% since 1991, an increasing share of the consumption is being supplied by imports. Major challenges facing the sector include increasing competition from low-cost producing countries, appreciation of the Canadian dollar, increasing production costs and greater retailer consolidation and expectations.”

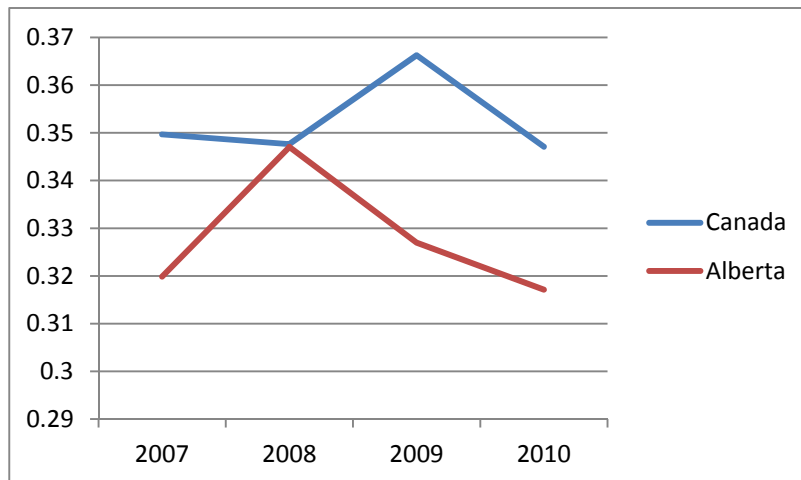
Certified Organic

Consumer sales of certified organic products topped \$400 million in Canada in 2008. Prepared foods was the largest category at 22%. Frozen certified organic vegetables showed significant growth between 2006 and 2008, growing from just under \$1 million to \$7.2 million during this two year period. A small category, certified organic dried fruit, grew from \$100,000 to \$400,000 between 2006 and 2008. (Source: AAFC, *The Canadian Organic Sector Trade Data and Retail Sales in 2008*).

CONSUMPTION: ALBERTA

Limited data is available through Statistics Canada on fruit, vegetable and potato consumption in Alberta. Figure 12 shows variability in the percentage of the population aged 12 and older who consume fresh fruit and vegetables five or more times per day. Compared to the Canadian average, fewer Albertans consume these products regularly, but there is a downward trend for both Alberta and Canada.

**Figure 12: Trends in Fruit and vegetable consumption
5 times or more per day Canada and Alberta
% of population aged 12 and older**



Source: Health indicator profile, annual estimates Statistics Canada CANSIM Table 105-0501
Population: Statistics Canada, CANSIM, table 051-0001

Table 14 provides more specific information about volumes and trends in retail sales of potatoes, vegetables and fruit in Alberta. This data includes domestic and imported production, as well as other fruits and vegetables not grown or processed in Alberta. Generally, these trends follow Canada wide trends. Local market opportunities for fresh or processed products experiencing positive growth include:

- Fresh onions
- Canned and bottled carrots, corn on the cob, peas and beans
- Dried vegetables
- Fresh berries
- Sweet spreads

Table 14: 2010 Fresh and Processed Alberta Potato, Vegetable and Fruit Retail Sales (\$)

	52 weeks ending December 18, 2010	% change over 2009
Fresh Vegetables	454,967,327	0%
Fresh carrots	28,096,768	-5%
Fresh onions	37,625,424	16%
Fresh potatoes	54,599,324	-9%
Frozen Vegetables	41,503,354	-6%
Cauliflower	97,180	-37%
Corn	5,527,535	-7%
Green Beans	1,277,451	-4%
Peas	5,251,378	-6%
Mixed Frozen Vegetables	13,028,325	-5%
Other frozen vegetables	13,062,002	-7%
Canned & Bottled Vegetables	69,470,439	3%
Canned & bottled beans	2,824,650	-16%
Canned & bottled carrots	75,046	4%
Canned & bottled corn	9,843,544	-7%
Canned & bottled corn on the cob	691,300	1%
Canned & bottled mixed vegetables	212,992	-7%
Canned & bottled peas	1,529,731	-10%
Canned peas - remaining	3 5,041	-23%
Canned & bottled peas & carrots	329,804	0%
Canned vegetables - remaining	4,393,737	6%
Canned & bottled potatoes	1,721,993	-1%
Canned & bottled peas & beans	2,153,871	19%
Canned beans - remaining	3,421,243	10%
Dry vegetables (including potatoes/rice)	60,330,974	0%
Dry vegetables (not including potatoes/rice)	3,835,800	9%
Other Vegetables		
Potato chips	8 2,936,890	0%
Pickles	19,376,180	1%
Vegetable juices	16,154,074	-4%
Fresh fruit	486,017,782	-1%
Fresh berries	89,792,737	4%
Frozen fruit	23,511,413	-7%
Jam/jelly/marmalade	19,414,530	-1%
Sweet spreads	6,885,815	4%
Chilled berry blend juices & drinks	4,900,140	-2%

Source: Nielsen MarketTrack, Alberta All Channels, 52 weeks ending December 18th, 2010.

Stored Vegetable Opportunity

Strong consumer growth is being seen for a number of stored vegetable crops and some fresh vegetables not presently considered to be commercially produced crops in Alberta (Table 15). These crops may represent expansion opportunities for Alberta producers, pending availability of (irrigated) land and suitable climate. Stored vegetable crops may present an opportunity for satisfying a longer, local market season with Alberta produce.

Table 15: Trends in Consumption of Selected Field Vegetables in Canada, 2010

Kg per person per year, adjusted for retail, household, cooking and plate loss.

Crops	Kg per person	Change 2006-2010
Stored Vegetables		
Rutabagas and turnips	0.58	26%
Parsnips	0.08	24%
Beets	0.32	10%
Other edible roots	0.25	58%
Pumpkin and Squash	1.51	6%
Other Fresh Vegetables		
Brussels Sprouts	0.15	75%
Asparagus	0.26	18%
Radishes	0.42	15%
Leeks	0.15	17%
Lettuce	5.65	-7%
Broccoli	1.14	-11%

Source: Statistics Canada CANSIM Table 002-0011

Currently (in 2010) Alberta reported negligible seeded acreage in asparagus, Brussels sprouts, leeks, squash, radishes, and rutabagas/turnips while, as a point of comparison to Alberta, Manitoba reported some marketed production in most of these crops (Table 16).. Manitoba has a single desk marketing organization, under the “Peak of the Market” brand that, is generally regarded as a significant competitor to local produce marketed through retail channels, including in Alberta.

Table 16: Area, production and farm value of selected vegetables in Manitoba 2010

	2010 MB Acres Seeded	2010 Marketed production tons	Farm Gate Value (\$1,000s)
Parsnips	98	819	\$810
Pumpkins	159	812	\$360
Squash and zucchinis	100	685	\$615
Rutabagas and turnips	100	516	\$517
Asparagus	211	230	\$668
Leeks	6	47 ^E	\$54
Radishes	12	5	\$9
Beets	53	x	x
Lettuce	42	X	X

Source: Statistics Canada CANSIM Table 001-0013

Peak of the Market (“Peak”) is a grower-owned not for profit vegetable supplier and operates in Manitoba under the Farm Products Marketing Act. Peak of the Market has operated in Manitoba for 70 years and supplies over 120 different varieties of Manitoba grown vegetables. Peak is a year round supplier of various vegetables, made

possible by one of the most technologically advanced storage programs in North America. Many vegetables, such as Potatoes, Carrots, Onions, Parsnips, Beets, Cabbage and Shallots can be stored for long periods in controlled environment storage facilities. Peak of the Market, along with its growers, employs over 1,000 Manitobans and injects over 70 million dollars a year in to the economy. In addition to shipping vegetables in Canada, Peak also ships throughout the United States, and occasionally into Asia, Europe, Latin America and the Caribbean. Peak of the Market has expanded over the years and today has 40 Manitoba Family Farms⁵. Similarly, Ontario has a large fruit and vegetable industry and requires sales of many crops, including thirteen processing vegetables, through marketing boards under their *Farm Products Marketing Act*.

There are some similar structures for elements of Alberta's fresh fruit and vegetable industry. Farm direct fruit and vegetable producers in Alberta are united under the Alberta Farm Fresh Producers Association⁶. To be eligible to contract with a processor to grow vegetables for the processed vegetable market in Alberta, a person must register and obtain a licence under the Alberta Vegetable Growers (Processing) Production and Marketing Regulation. Alberta seed, table and processing potato growers are united under the Potato Growers of Alberta⁷ and are regulated in Alberta under the Marketing of Agricultural Products Act's Potato Growers of Alberta Marketing Regulation. However, Alberta has no such single desk marketing organization for commercial fresh fruit and vegetables, nor does it have a unified producer group representing the interests of this sector of the produce industry.

⁵ www.peakmarket.com

⁶ www.albertafarmfresh.com

⁷ www.albertapotatoes.ca

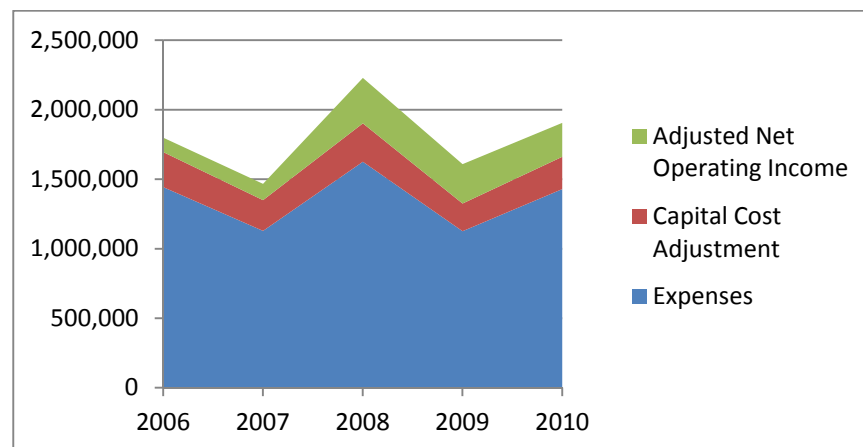
PROFITABILITY OF ALBERTA POTATO, VEGETABLE AND FRUIT SECTORS

Statistics Canada reports profitability by farm type on an annual basis. This information is derived from individual or corporate tax filer data. It includes unincorporated farms and communal farming organizations (with gross operating revenues of \$10,000 or more) and incorporated farms (with gross operating revenues of \$25,000 or more). Farms are classified by type according to the crop that generates the majority (>50%) of revenue.

Therefore this data is not specific to “commercial” producers and reflects financial information for all sizes of potato, vegetables and fruit operations, whether direct marketed, sold to processors or wholesaled. Potato data includes table, processing and seed potatoes.

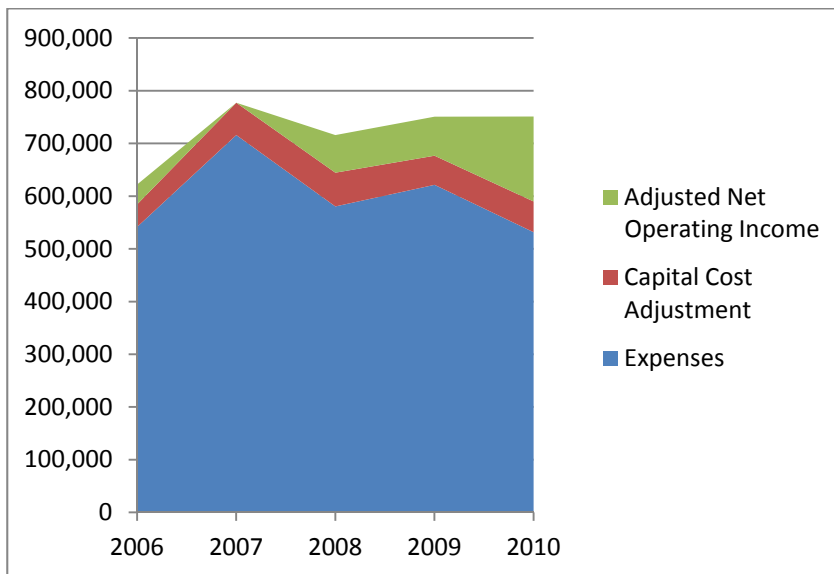
The following charts depict trends in profitability by farm type for Alberta. Expenses include all operating expenses for the entire operation, not just those expenses attributable to potato, and other vegetable or fruit crops. The sum of the expenses (blue), capital cost adjustment (red) and net operating income adjusted for capital cost allowance (green) equals the revenue from all sources for that operation, including other crops, livestock, program payments and other revenues (excluding off farm income). The sum of the adjusted net operating income (green) and adjustment for capital cost (red) equals the net operating income.

Figure 13: Alberta Potato Farm Type: Trends in Profitability



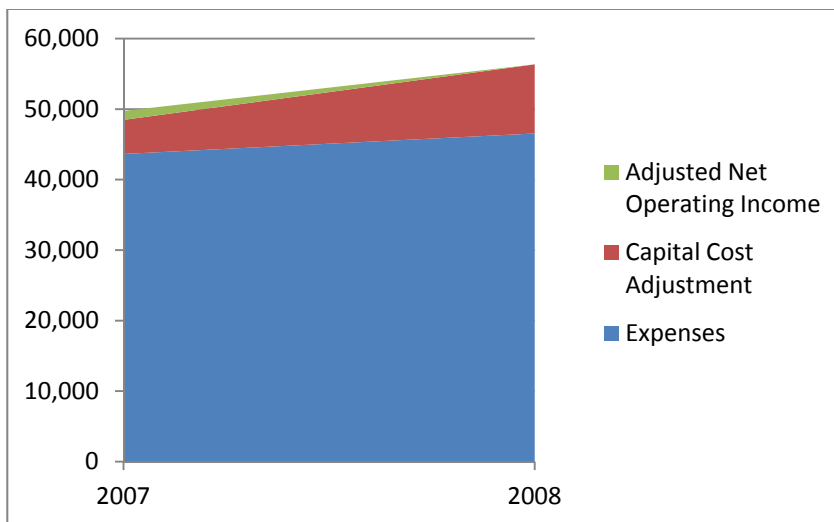
Source: Statistics Canada CANSIM Table 002-0044

Figure 14: Alberta Vegetable Farm Type: Trends in Profitability



Source: Statistics Canada CANSIM Table 002-0044
 Excludes potatoes and melons
 2007 net operating income adjusted for capital cost allowance was negative \$3, 299 and is therefore shown as 0 in the chart above

Figure 15: Alberta Fruit Farm Type: Trends in Profitability



Source: Statistics Canada CANSIM Table 002-0044
 Data for 2006, 2009, 2010 is too unreliable to be published.
 2008 net operating income adjusted for capital cost allowance was negative \$7, 513 and is therefore shown as 0 in the chart above



Table 17 provides a detail of average operating revenues and expenses for potato, vegetable and fruit farm types for 2010. Data for Alberta and Canada is provided for the potato and vegetable sectors, Canada only data is provided for fruit. Alberta data for the fruit farm type was too unreliable to report in 2010.

Table 17: Average Operating Revenues and Expenses by Farm Type, 2010

Revenues and expenses	Main Farm Type				
	Potato		Vegetable		Fruit
	Canada	Alberta	Canada	Alberta	Canada
Number of farms	1,115 ^A	90 ^B	2,325 ^A	55 ^B	4,715 ^A
Total operating revenues	1,154,731^A	1,905,734^B	452,486^A	751,382^B	235,972^A
Total crop revenues	1,004,386 ^A	1,575,136 ^B	410,197 ^A	703,523 ^B	199,274 ^A
Potato revenues	887,674 ^A	1,324,810 ^B	5,017 ^D	x	179 ^D
Fruit revenues	1,084 ^E	0	4,151 ^B	x	191,596 ^A
Vegetable revenues	13,547 ^D	11,844 ^D	371,113 ^A	658,087 ^B	3,502 ^C
Total livestock and product revenues	16,400 ^B	x	1,382 ^E	x	752 ^E
Program payments and insurance proceeds	79,728 ^B	x	24,574 ^B	x	19,289 ^B
Total other revenues	54,217 ^B	118,004 ^D	16,333 ^B	17,936 ^C	16,656 ^B
Custom work and machine rental revenues	34,015 ^B	58,727 ^E	10,234 ^B	x	9,953 ^B
Rental income	11,828 ^B	43,047 ^C	3,506 ^C	x	2,216 ^C
Miscellaneous revenues	8,375 ^C	F	2,593 ^D	2,807 ^B	4,487 ^C
Total operating expenses	952,594^A	1,429,392^B	387,188^A	531,675^B	211,143^A
Total crop expenses	343,771 ^A	x	114,258 ^A	135,566 ^D	40,974 ^A
Fertilizer and lime expenses	133,955 ^A	136,713 ^B	28,572 ^B	41,456 ^D	9,276 ^A
Pesticide expenses	95,756 ^A	127,047 ^B	21,449 ^B	25,583 ^D	11,648 ^A
Seed and plant expenses	89,937 ^A	132,055 ^B	32,327 ^A	32,455 ^D	6,258 ^B
Other crop expenses	24,123 ^B	x	31,910 ^B	36,073 ^D	13,792 ^B
Total livestock expenses	8,916 ^C	x	1,034 ^D	x	697 ^C
Total machinery expenses	112,809 ^A	145,501 ^B	38,033 ^A	x	18,438 ^A
Small tool expenses	330 ^B	335 ^D	509 ^B	x	389 ^A
Net fuel expenses, machinery, truck, auto	46,074 ^A	53,531 ^C	14,670 ^A	20,174 ^A	7,265 ^A
Repair, license and insurance expenses	66,405 ^A	91,635 ^B	22,854 ^A	40,892 ^B	10,784 ^A
Total general expenses	487,098 ^A	842,284 ^B	233,864 ^A	333,641 ^B	151,035 ^A
Salaries, including CPP, QPP, EI	177,456 ^A	232,492 ^C	116,990 ^B	151,598 ^B	70,743 ^A
Rent expenses	53,543 ^B	130,745 ^C	15,910 ^B	6,038 ^E	6,522 ^B
Insurance expenses	21,678 ^A	31,629 ^B	7,363 ^A	14,450 ^C	4,023 ^A
Utility expenses	24,090 ^A	54,394 ^B	11,468 ^B	19,662 ^B	5,107 ^A
Custom work and machine rental expenses	70,470 ^B	171,835 ^C	25,479 ^B	45,532 ^D	17,573 ^B
Net interest expenses	47,440 ^A	64,626 ^C	12,815 ^B	12,307 ^D	12,640 ^A
Net property taxes	6,648 ^A	6,881 ^D	2,735 ^B	2,676 ^B	2,456 ^A
Building and fence repairs	12,378 ^A	22,459 ^C	6,550 ^B	15,115 ^B	3,567 ^A
Marketing expenses	28,209 ^B	48,614 ^C	14,833 ^B	35,631 ^B	10,741 ^B
Miscellaneous expenses	45,187 ^A	78,609 ^B	19,722 ^A	30,632 ^B	17,664 ^D
Net operating income	202,137	476,342	65,298	219,707	24,828
Adjustment for capital cost allowance	104,708 ^A	232,083 ^C	30,549 ^A	58,466 ^B	18,902 ^A
Net operating income adjusted for capital cost allowance	97,429	244,259	34,749	161,241	5,927

Source: Statistics Canada CANSIM Table 002-0044

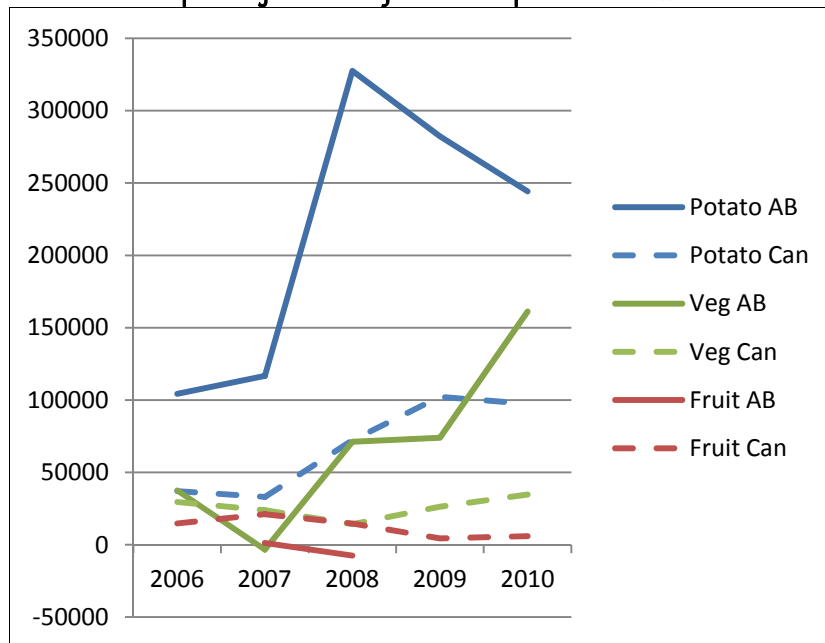
Other vegetable excludes potatoes and melons

E Use with caution, F Too unreliable to be published, x Suppressed to meet the confidentiality requirements of the Statistics Act

Most of the estimates contained in this table have been assigned a letter to indicate their coefficient of variation (c.v.) (expressed as a percentage). The letter grades represent the following coefficients of variation: A is used for a c.v. between 0.00% and 4.99% and means Excellent, B is used for a c.v. between 5.00% and 9.99% and means Very good, C is used for a c.v. between 10.00% and 14.99% and means Good, D is used for a c.v. between 15.00% and 24.99% and means Acceptable, E is used for a c.v. between 25.00% and 34.99% and means Use with caution. F replaces the data when the c.v. is equal to or greater than 35.00% and means too unreliable to be published. The quality of the estimates not accompanied by a data quality symbol is assessed to be acceptable or better.

Figure 16 shows that Alberta potato and other vegetable farms generate on average higher net operating income (adjusted for capital cost allowance) than the average for Canada. For both potato and other vegetable farm types, average profit per operator has generally been trending upward, but fruit is trending downward. In general Alberta shows more year over year variability in net operating income adjusted for capital cost allowance than for the whole of Canada. This would be expected for any concentrated geographical area such as Alberta.

Figure 16: Summary - Trends in Profitability Alberta and Canada By Farm Type
Net operating income adjusted for capital cost allowance



Source: Statistics Canada CANSIM Table 002-0044
 Data for 2006, 2009, and 2010 for Alberta Fruit farm type is too unreliable to be published.

Table 18 compares average expense and income as a ratio of total operating revenues, by farm type for Canada and Alberta. Data for potato and vegetable farm types was averaged over 5 years to calculate these ratios. Data for the fruit farm type was averaged for 2007 and 2008 only because Alberta data for fruit was too unreliable to report in 2006, 2009 and 2010.

The purpose of this table is to provide a basis for comparing Alberta vs. Canada rather than in absolute numbers. A multi-year average is used to smooth annual anomalies typical within a smaller geographic area, due to production differences (often weather related) and local market prices. The Number of farms and total operating revenues are shown as actual numbers because the ratios apply to these numbers. For example, for the Canada Potato Farm Type, .756 (or 75.6%) of the operating revenue was from the potato crop. For Alberta it was 68.9%.



Table 18: Ratio of Average Income and Expenses to Total Operating Revenues by Farm Type Canada and Alberta

Revenues and expenses	Potato Farm Type Average 2006-2010		Vegetable Farm Type Average 2006-2010		Fruit Farm Type Average 2007-2008	
	Canada	Alberta	Canada	Alberta	Canada	Alberta
Number of farms	1,217	88	2,435	52	4,840	73
Total operating revenues	\$980,607	\$1,801,596	\$394,270	\$722,882	\$210,557	\$49,297
Potato revenues	75.6%	68.9%	1.2%	0.0%	0.1%	X
Fruit revenues	0.1%	0.0%	0.9%	0.0%	82.6%	66.6%
Vegetable revenues	1.2%	0.8%	79.8%	78.5%	1.8%	X
Program payments and insurance proceeds	8.4%	10.4%	6.8%	18.0%	7.7%	X
Total other revenues	4.6%	6.0%	4.0%	4.0%	5.9%	24.5%
Total operating expenses	83.4%	75.0%	86.6%	82.8%	83.9%	91.5%
Total crop expenses	28.8%	20.4%	24.7%	19.1%	16.5%	12.9%
Fertilizer and lime expenses	11.5%	7.7%	6.3%	5.3%	3.8%	4.3%
Pesticide expenses	7.9%	6.0%	4.7%	3.6%	4.8%	4.8%
Seed and plant expenses	7.4%	6.4%	6.6%	5.0%	2.8%	2.0%
Other crop expenses	2.0%	0.9%	7.0%	4.7%	5.1%	1.0%
Total machinery expenses	10.4%	8.1%	9.0%	8.7%	8.0%	18.4%
Small tool expenses	0.0%	0.0%	0.1%	0.1%	0.2%	2.0%
Net fuel expenses, machinery, truck, auto	4.6%	3.3%	3.8%	3.6%	3.3%	7.4%
Repair, license and insurance expenses	5.8%	4.8%	5.1%	5.4%	4.5%	9.1%
Total general expenses	43.1%	44.6%	52.4%	54.4%	59.1%	58.8%
Salaries, including CPP, QPP, EI	15.5%	12.5%	25.5%	21.4%	26.5%	8.1%
Rent expenses	4.6%	6.7%	3.9%	3.4%	2.5%	X
Insurance expenses	1.9%	1.7%	1.6%	1.5%	1.6%	2.9%
Utility expenses	2.1%	2.8%	2.6%	3.7%	2.0%	4.8%
Custom work and machine rental expenses	5.8%	8.1%	5.5%	6.5%	8.5%	4.4%
Net interest expenses	5.0%	4.6%	3.2%	2.5%	5.6%	19.2%
Net property taxes	0.6%	0.3%	0.7%	0.3%	0.9%	3.2%
Building and fence repairs	1.1%	1.2%	1.5%	1.3%	1.5%	X
Marketing expenses	2.6%	2.6%	3.3%	6.1%	3.6%	X
Miscellaneous expenses	3.9%	4.1%	4.6%	3.6%	6.4%	10.5%
Net operating income	16.6%	25.0%	13.4%	17.2%	16.1%	8.5%
Adjustment for capital cost allowance	9.6%	13.1%	6.9%	7.8%	7.6%	14.9%
Net operating income adjusted for capital cost allowance	7.0%	11.9%	6.5%	9.4%	8.5%	-6.3%

All ratios are expressed as a percentage of the total operating revenues.

Source: Statistics Canada CANSIM Table 002-0044

The potato and vegetable sectors in Alberta are very competitive with operations in Canada as a whole, probably due to the larger average scale of operations. Alberta operations generate about twice the annual revenue in these two sectors as those in Canada overall. Operations in the fruit sector in Alberta generate only about one-quarter the revenue of this farm type as in the rest of Canada, but profitability is low or negative. It should be noted that fruit data includes all fruit for Canada (e.g. tree fruit, berries, grapes etc.) while in Alberta the sector is dominated by small fruits such as berries.

Potato Farm Type

Capital cost adjusted net operating income for Alberta potato farm types is 12% of total operating revenue, compared to just 7% for Canada as a whole.

Notable expenses that have higher ratios to total operating revenues in Alberta compared to the rest of Canada for potato farm types include:

- Rent
- Custom work and machine rental expense
- Adjustment for capital cost allowance
- Utility expense
- Building and fence repair
- Miscellaneous expense

Building and fence repair, miscellaneous expense, marketing, interest and insurance expenses as a percentage of total operating revenues are comparable between Alberta and Canada as a whole for potato farm types.

Alberta demonstrates lower expense as percentage of total operating revenues for potato farm types for:

- Property taxes
- Crop expense (Fertilizer, pesticide, seed and plants, other)
- Total machinery expense (including fuel)
- Salaries including Canada Pension Plan (CPP), and EI (Employment Insurance) employer contributions.

Vegetable Farm Type

Capital cost adjusted net operating income for Alberta vegetable farm types is 9% of total operating revenue, compared to just 7% for Canada as a whole.

Notable expenses that have higher ratios to total operating revenues in Alberta compared to the rest of Canada for vegetable farm types include:

- Marketing expense
- Utility expense
- Custom work and machine rental expense
- Adjustment for capital cost allowance

Machinery expense and insurance as a percentage of total operating revenues are comparable between Alberta and Canada as a whole for vegetable farm types.

Alberta demonstrates lower expense as percentage of total operating revenues for vegetable farm types for:

- Property taxes
- Crop expense (Fertilizer, pesticide, seed and plants, other)
- Interest expense
- Miscellaneous expense
- Salaries including CPP and EI
- Building and fence repairs
- Rent

Fruit Farm Type

The average of the capital cost adjusted net operating income ratio to total operating revenue for Alberta fruit farm types was negative in 2007-2008, compared to 9% for Canada as a whole.

Alberta expense ratios to total operating revenues were similar or below that in all Canada for crop expenses. Higher expense ratios for Alberta vs. Canada were noted for other expense categories such as machinery expense, utilities, adjustment for capital cost allowance, insurance and miscellaneous expenses. The Alberta salary expense ratio for fruit farm types was significantly below that for all of Canada. These patterns reflect the small scale of Alberta fruit operations and prevalence of owner-operator labour.

All Crop Farm Types

All crop farm types in Alberta show a five year average capital cost adjusted net operating income ratio to total operating revenues of 15%. This compares to 9% for all crop farm types in Canada.

Profitability of Alberta potato farm types at 12% and vegetable and fruit farm types at 9% each are somewhat below the Alberta average for all crop farm types (15%).

Further analysis was conducted to compare Alberta potato and vegetable farm types to those in Manitoba because of the competition (Peak of the Market) from that province in the Alberta market.

Alberta's Competitiveness with Manitoba: Potato and Vegetable Farm Types

As noted previously, Alberta faces competition from Manitoba that markets produce under the "Peak of the Market" brand and legislated marketing organization. The average scale of Manitoba potato farms types is larger than those in Alberta while the scale of vegetable farm type is very similar between provinces. A three year average comparison between the two provinces indicates that profitability of Alberta potato and vegetable farm types is greater than those in Manitoba (Table 19). Net operating income adjusted for capital cost allowance is 15% for Alberta potato farm types, as compared to 12% for Manitoba. For vegetable farm types, Alberta at 14% compared favorably to Manitoba at 6%. A higher ratio of program payments and insurance proceeds to total operating revenues was noted for Alberta over Manitoba.

Table 19: Alberta Manitoba Profitability Comparison: Potato and Vegetable Farm Types

Revenues and Expenses	Potato Farm Type Average 2008-2010		Vegetable Farm Type Average 2008-2010	
	AB	MB	AB	MB
Number of farms	88	93	57	35
Total operating revenues	\$1,914,271	\$2,835,070	\$739,382	\$783,969
Potato revenues	66.5%	73.9%	--	--
Vegetable revenues	--	--	75.7%	80.4%
Program payments and insurance proceeds	19.0%	2.7%	17.6%	6.9%
Total other revenues	5.9%	3.6%	4.8%	3.6%
Total operating expenses	72.8%	79.7%	78.2%	86.0%
Total crop expenses	20.0%	27.1%	18.2%	20.0%
Fertilizer and lime expenses	7.6%	11.5%	5.4%	2.9%
Pesticide expenses	6.1%	7.7%	3.5%	2.9%
Seed and plant expenses	6.1%	7.0%	4.5%	6.5%
Other crop expenses	0.6%	0.8%	4.9%	8.3%

Revenues and Expenses	Potato Farm Type Average 2008-2010		Vegetable Farm Type Average 2008-2010	
	AB	MB	AB	MB
Total machinery expenses	7.9%	9.0%	8.5%	8.5%
Small tool expenses	0.0%	0.0%	0.1%	0.1%
Net fuel expenses, machinery, truck, auto	3.1%	4.4%	3.1%	3.7%
Repair, license and insurance expenses	4.7%	4.6%	5.3%	4.7%
Total general expenses	43.2%	42.9%	51.3%	56.7%
Salaries, including CPP, QPP, EI	11.7%	14.6%	21.0%	32.9%
Rent expenses	6.3%	5.8%	1.7%	1.8%
Insurance expenses	1.6%	1.7%	1.7%	1.2%
Utility expenses	2.7%	2.0%	3.8%	2.6%
Custom work and machine rental expenses	8.3%	7.4%	6.2%	4.5%
Net interest expenses	4.2%	4.1%	2.2%	1.2%
Net property taxes	0.3%	0.7%	0.3%	0.8%
Building and fence repairs	1.1%	1.0%	1.2%	1.5%
Marketing expenses	2.5%	1.9%	5.9%	5.6%
Miscellaneous expenses	4.3%	3.5%	4.0%	4.5%
Net operating income	27.2%	20.3%	21.8%	14.0%
Adjustment for capital cost allowance	12.3%	8.5%	8.0%	8.5%
Net operating income adjusted for capital cost allowance	14.9%	11.9%	13.8%	5.5%

All ratios are expressed as a percentage of the total operating revenues.

Source: Statistics Canada CANSIM Table 002-0044

Market Garden Subsector

Table 20 provides detailed estimates of the yields, production costs, expected revenue and gross margins of a wide range of vegetable crops in the market garden subsector for 2008 with some relative measure of the unit costs and revenue that can be expected from these crops. The production costs do not include operating and ownership costs of equipment. These estimates are subject to wide variability given the different management and marketing practices employed across the province, and agronomic production capacity.

Of these field crops, carrots stand out having the largest expected gross margin of close to \$5,000 per acre. Corn and onions follow with expected gross margins of over \$2,000 per acre.

Table 20: Vegetable Production, Cost, Revenue and Gross Margin Estimates, 2008

Crop	Yield	Production Costs	Gross Revenues	Gross Margin
	(tonnes/ acre)	(\$/acre)	(\$/acre)	(\$/acre)
Beans	3.5 - 4.5	896	2,041	1,145
Broccoli	1.75 - 2.5	2,506	3,483	977
Cabbage	700 - 800 cases	3,078	4,698	1,620
Carrots	13-15	3,640	8,424	4,784
Cauliflower	5.5 - 7.5	2,209	2,840	631
Corn	1,000 doz.	1,253	3,429	2,176
Onions – dry	13 - 15	4,293	6,475	2,182
Potatoes (Fresh)	9.5 - 11.5	1,372	2,516	1,144

Source: ARD, Fresh Vegetable Market Gardening Industry, 2008, AGDEX FS250/830-1.

ALBERTA COMMERCIAL PRODUCERS, PACKERS AND PROCESSORS

There has been an increasing level of concentration within the commercial vegetable industry. This, in addition to other industry history, makes it difficult at times to discern what roles are played by various industry participants. While it is relatively easy to identify those companies that are strictly processors of potatoes, for example, it is more difficult to define what constitutes a packing activity as opposed to processing. In addition, quite a number of vegetable producers have also taken on some minor packer/shipper roles as they handle some other nearby growers' products as well as their own.

It would be erroneous to create separate lists of producers, processors, and packer/shippers in the current state of Alberta's commercial vegetable industries. While there are still many participants who play a role in only one of these subsectors, many play a role in at least two of them. Many commercial vegetable growers are also greenhouse vegetable producers, and market gardeners. Some also do some first-stage value added processing (cutting, sorting and packaging).

The number of commercial vegetable growers versus the total number of vegetable growers in Alberta can only be estimated because Statistics Canada does not report the distribution of vegetable and fruit producers by farm size due to confidentiality reasons. For example, Statistics Canada (CANSIM Table 002-0048) reported 50 potato farm types with net operating income of \$100,000 and over in Alberta in 2010.

The vegetable, fruit and potato processing industries in Alberta consist of a mix of both small and large scale processors. The potato industry represents the largest scale processors – Lamb-Weston, Maple Leaf, McCain Foods, Old Dutch and Frito Lay, which are all located in southern Alberta.

The total value of processed potatoes in Alberta in 2008 was estimated at about \$735 million. Of this \$38 million was of fresh pack potatoes, \$167 million potato chips and \$530 million of fries.⁸

The value of fresh vegetable processing was estimated at \$76 million in 2004.⁹ The value in 2010 is estimated to be at least \$100 million. The processing of other vegetables and fruit in the province is typically done by smaller scale processors. Some of the characteristics of these processors are the generally low profit margins they operate on, due to the competition that they experience from US, Mexican, and South American imports. Over the years, there have been a number of the smaller and intermediate sized vegetable processors that either closed operations, or were taken over or merged with other processors.

A reasonable observation about the vegetable processing industry is that it is in a fragile state, except for the potato processing segment. For example, one of the largest vegetable producers in the province was involved in the production and processing of carrots, but the carrot aspect of their operation was purchased by a US firm, the largest producer of carrots in North America. This allowed the US producer and processor to increase their exports of carrots to Canada, and further weakened Alberta's balance of trade in vegetables. The vegetable processors still existing tend to operate on small margins, and with limited financial capacity to take advantage of new technology, equipment and market opportunities.

The vegetable processing industry in Alberta is in a fragile state.

⁸ Potato Growers of Alberta.

⁹ ARD, Based on industry interviews, and the Canadian Business Data Disk.

COMPETITIVE ANALYSIS

The reality is that the Alberta commercial vegetable industry (excluding potatoes) has not increased significantly over the past decade. Imports continue to grow; exports are slowly declining, resulting in a growing trade deficit. Many of the vegetable processors work on a small profit margin, and are not in a position to invest in equipment and technology so as to be able to expand.

In preparing this report we reviewed a significant amount of literature and also discussed the situation with a number of industry experts.

A total of eight competitive issues appear to be impacting the reality faced by the sector (both primary and processing). This section reviews each of these and provides an assessment of how they affect the industry's ability to compete and how they might impact processor profitability.

LOW COST IMPORT COMPETITION

The vegetable industry is extremely price competitive. For very small differences in price, a retailer will switch suppliers. Retailers and wholesalers of vegetables need to be able to secure a reliable year-round supply of vegetables. With the exception of some greenhouse vegetables such as tomatoes, peppers and cucumbers, fresh field vegetable producers have the capacity to supply for only short periods of time in the summer and fall. Therefore, the retailers must always have a source of imported vegetables and fruits.

Vegetables produced in the United States, Mexico, and South America can typically be grown year-round. As well, the US and Mexican producers are of a much larger scale, with lower costs of production and usually the ability to offer more consistent quality.

The strength of the Canadian dollar has provided some marginal advantage for Alberta producers selling domestically, but has created a competitive disadvantage for exports. However, as the livestock sector has learned, the vegetable industry needs to be careful using foreign exchange as a source of competitive advantage.

This issue makes it very difficult to maintain long term processing capacity in Alberta. Due to the nature of production it is important to have processing capacity located close to the production base. Since the costs tend to be higher for both segments this creates significant disadvantages for processing in the province. Alberta has an opportunity to develop niche market processing opportunities such as development of Saskatoon processed products (for nutrition & health benefits), pea snacks, or processing of vegetables as condiments.

LOCAL FOOD TRENDS

There has recently been a continuously growing demand for healthy, organic and locally produced foods in Canada. There are several types of local food initiatives in Alberta, although the majority of producers could be categorized as commercial producers and direct-marketers. Some of the types of local food initiatives include the following:

1. **Farmers' Markets:** Farmers' markets are public markets where farmers, and often other vendors, sell locally produced food directly to consumers. The pace of growth of farmers' markets has been phenomenal. There are currently over 500 farmers' markets in Canada. The number of farmers' markets across Canada has doubled since the late 1980's, with urban centres such as Toronto adding six new markets in 2007. British Columbia added 40 new farmers' markets between 2000 and 2006, while

Ontario farmers' markets increased from 60 in 1991 to 132 in 2007. In Alberta there are over 120 farmers' markets, with some 1500 registered vendors.

2. **Community Supported Agriculture (CSAs):** A CSA is an alternative agricultural food distribution system that engages consumers as equal partners in the growing of food. Consumers take on some of the risk of the farm by paying up front for a share of the season's produce grown by a local farmer or a group of farmers. The food is delivered direct to consumers or to nearby drop off points on a weekly basis throughout the growing season. Most CSAs have between 35 and 200 members and most are based close to large urban centres. This model is particularly prevalent in Québec due to the efforts of the non-profit group *Équiterre*, which has linked up more than 100 small-scale producers with urban consumers. The CSA model is also gaining popularity in British Columbia, Ontario, and Alberta.
3. **Local Food within Grocery Stores and Food Co-ops:** For consumers who find direct sales inconvenient and prefer to do all their shopping in a single locality, there are now a number of retail options. Some retailers are beginning to show an interest in locally grown foods, despite the fact that such foods represent a significant challenge to their centralized procurement and distribution systems.
4. **Institutional Procurement:** The Northern Alberta Institute of Technology in Edmonton has been increasing its local sourcing of food as part of their sustainability initiative, including sourcing all of their protein locally. Institutions like the University of Toronto are showing preferences for local foods. The university sources up to 15% of its food from Ontario and there are plans to increase this percentage over time.

The government of Nova Scotia supports local farmers by using policies that encourage the purchase of local products in provincial health care and justice institutes. The program currently gets 90% of processed dairy products such as butter and yogurt, 60% of fresh produce and up to 80% of fresh produce from storage, and 60% of beef, chicken and pork from local sources. In Michigan, the *Buy Michigan First* program promotes local food procurement in state institutions. One of the largest adopters of the program is the state prison program which has found that it can save significantly on the cost of food by buying locally grown food. The revenue helps Michigan farmers and fuels the state's economic prosperity.

5. **Restaurant and Chef Initiatives:** Because of their interest in fresh, high quality food, restaurants and chefs are playing an active role in promoting local food systems. Many restaurants have identified local farmers and set their menus based on the produce that is available on a given day in their region. Other chefs take this a step further and work on a contractual basis with local growers to grow the ingredients that the chef requires. This is happening in Alberta both directly and through *Dine Alberta*.
6. **Culinary Tourism and Regional Cuisine Initiatives:** With help from the Slow Food movement, culinary or agro-tourism initiatives are growing. These initiatives bring tourists to rural communities with driving routes, farm stays, and other activities linked to the consumption of locally produced food. Most provinces have developed, or are in the planning stages to develop, such initiatives. For instance, Québec has a number of scenic rural driving tours through parts of the province that have developed their own *Terroir* (regional cuisine) and in Alberta, around the Edmonton area the *Country Soul Stroll* offers a glimpse of local heritage, culture, artisans, gardens, farms and local food.
7. **Food Security or Policy Groups:** Food security groups across Canada work to assure that all Canadians have access to their vision of "sustainably grown, nutritious and affordable foods". The local food initiatives described in this brief are all seen as tools to achieve these objectives. Often they are sources of information and undertake public education on local food. Other activities include community gardens, urban agriculture (including intensive backyard and rooftop market gardening) and gleaning initiatives, where citizens collect unsold crops from farmers' fields. These groups often take stands on the preservation of local agricultural land.

A major trend which is, and will continue to provide a major advantage to Alberta vegetable producers is the consumer demand for more locally produced food, and the desire to know where and how their food is produced.

The Opportunity for Local Foods

The local food movement and concept is defined and interfaces with the 100 mile diet, “locavores”, slow food, organic, and environmentally responsible small scale agricultural production systems and concepts.

Some local food movement proponents argue these points, but further research would be beneficial to this relatively new area:

- ➔ The current food production, processing and distribution system is not sustainable.
- ➔ Industrial agriculture is environmentally degrading, and eventually unsustainable.
- ➔ The current food system results in a greater dependence on processed foods and imported food, both of which results in lower quality and less safe food.
- ➔ Food produced locally is environmentally better primarily due to the shorter transportation distances.
- ➔ Locally produced food is safer, healthier, better tasting, or is produced under more sustainable environmental production practices.
- ➔ Locally produced food provides greater food security to consumers.
- ➔ Locally produced food provides greater support to small scale farmers, and the local community; with greater economic benefits resulting from the distribution and processing margins now being captured by the producer.
- ➔ Local food production helps to reverse globalization trends.

Consumer surveys support the acceptance of these views and beliefs as social trend. A 2006 Ipsos Reid survey titled "Canadians see many benefits of locally grown food" found that Canadians have a tendency to ascribe a wide range of attributes to locally produced foods. For instance given a list of possible benefits of locally grown fruits and vegetables, respondents rated the top benefits as follows:

- ➔ 71% said local foods help the local economy,
- ➔ 70% said that they support family farmers,
- ➔ 53% said they taste better,
- ➔ 50% said they are cheaper,
- ➔ 48% said they are not genetically modified
- ➔ 45% said they were healthier
- ➔ 45% said such foods are chemical and pesticide free,
- ➔ 44% said they were safer and
- ➔ 43% thought they were more environmentally friendly.

This consumer perception of value has been studied by a number of researchers. For example, a 2010 study by the Vineland Research and Innovation Centre¹⁰ concluded that local food logos tended to have a greater effect on consumers' likelihood to purchase a product than did either organic or environmental logos. The benefit to producers was found as much in the consumers' tendency to purchase local products as in any potential price premiums for those products.

Much of the focus of this avenue of research has been on identifying market segments that have a preference for local food. A 2011 study conducted by Blacksheep Strategy for the Canadian Prairie Fruit Federation identified the following as some of the "mindset" characteristics for the core group of customers preferring local fruit:

- Seem to have had some experience earlier in their life where they've been exposed to fresh local fruit; many seem to grow their own fruit in their yards; don't seem to be too far removed from the farm
- Focus on quality as opposed to price / perhaps more 'aware' of food; flavour is key / 'picky'
- Health conscious
- Community-oriented / Conscious of supporting the local community / economy
- Value keeping it local

The trend toward local food is evidenced by the strong growth in farmers' markets in Alberta. According to ARD, there are currently over 120 farmers' markets in the province and 1,500 individual vendors. Those selling to farmers' markets include smaller scale fruit and vegetable growers, as well as some larger suppliers who attend multiple markets. The growth in farmers' markets and in the growing trend for market gardeners to supply direct to retail and food service outlets presents opportunities for small niche growers.

Most of the major retailers now have advertising and programs that emphasize local food supply over imported supply. For some of the retailers, this started as a marketing ploy, but more recently, they have translated this into real local food purchases. For example, in 2008 the Loblaw Companies Limited, Canada's largest food distributor, sourced 24% of their produce locally, with 40% being local during the summer of 2008.¹¹ For many of the retailers, if they could get a reliable and year round supply of Alberta vegetables which were competitively priced, this would be their preference.

The local food movement may be the most important driver of small scale processing.

In summary, the local food trend does suggest that some elements of the consuming demographic may be willing to pay more for vegetables produced and processed locally. The local food movement offers new opportunities for the Alberta commercial vegetable industry. However, the produce will always have to be price competitively to the imported supply. It is also important to recognize the relative size differential between local food markets and that of the conventional retail sector.

CLIMATIC CONDITIONS

Most fresh field vegetable production in Alberta will have an agronomic disadvantage to crops grown in warmer climates. If climate change in the future were to raise the temperature and alter the growing conditions significantly, Alberta may increase its competitive advantage for the production of certain vegetable crops.

One of the largest vegetable crops grown in Alberta is carrots, both for the fresh and processed markets. In Alberta it is possible to get 8 to 10 tons per acre (see Table 3). As shown by a California study of carrot production (Tables 5 and 6), the average yield of fresh carrot production is closer to 15 tons per acres. The yield of carrots for processing is approximately twice this level. As well, in California there is typically the ability to

¹⁰ Campbell et al, *Purchase Drivers of Canadian Consumers of Local and Organic Produce*, 2010.

¹¹ Vineland Research and Innovation Centre, *Consumer Perception of Local: A National Study*. Reference to a study by Britnell 2010, from a presentation provided at a local food workshop August 2011.

harvest two crops per acre per year. Importantly, on an annual single crop basis, Alberta production can approximate the yield of vegetable production from importing countries.

Table 22: California Fresh Carrot Production

Year	Acreage	Average Yield (Ton/Acre)	Gross Value/Acre
2003	68,000	15.00	\$6,120
2004	66,500	15.25	\$6,558
2005	67,500	15.50	\$6,677
2006	69,500	15.25	\$6,389

Table 23: California Processing Carrots Production

Year	Acreage	Average Yield (Ton/Acre)	Gross Value/Acre
2003	3,500	32.3	\$3,230
2004	4,300	32.0	\$3,552
2005	4,100	35.0	\$2,870
2006	4,500	33.0	\$4,125

Source: National Agriculture Statistics Service 2007 (United States Department of Agriculture, 2007).

The reality of having only one crop per year is of major concern for the Alberta industry as the land values have not responded to this reality. Since land is a significant factor in the cost of production, the relatively low profitability means that production carries significantly greater margin risk. This in turn reduces the guarantee of steady supply required by processors.

The opportunity to overcome this climatic disadvantage in Alberta lies in value-added products that could be held-over winter in storage. An example is Alberta carrots, which have higher nutritional value than those grown in warmer, faster growing climatic conditions. If these could be stored over winter, they could be marketed for those specific qualities. Further research in these areas would help determine Alberta's niche market opportunities in vegetables and fruits, given the restrictions posed by the climate.

The major competitive issue is that with Alberta's climate, it is only possible to produce one crop per year, versus multiple crops in the more southern United States, Mexico and South America. The climate creates a smaller production window and with the perishability of these crops, it also reduces the local marketing window.

LABOUR

Labour represents a significant cost of production for the production and processing of fresh vegetables – to say nothing of the difficulty in finding staff willing to work in the sector. The following table provides a summary of Alberta labour rates for agricultural production and food processing in 2011.

Table 24: Alberta Wage and Salary data for Selected Agricultural Occupations 2011

	General Farm Workers	Harvesting Labourers	Labourers in Food, Beverage and Tobacco Processing
National Occupation Code	8,431	8,611	9,617
Median Hourly Wage	\$16.00	\$11.00	\$13.00
Hourly Range	\$14.00-19.00	\$9.00-12.00	\$11.95 16.50
Average Hours Worked (per week)	47.70	46.70	39.20

Employers were asked if they recruited to this occupation over the past two years and had experienced hiring difficulties or currently have vacancies of over four months for the occupation. It is important to note that the information below is a snapshot in time and represents the opinions of the organizations that responded to the survey. Significant difficulty was reported in hiring for labour occupations in agricultural production and food processing. The seasonality of work explains the four-month unfilled vacancies and 2011 vacancy rate for harvesting labour reported in Table 25.

Table 25: Skills Shortage Information for Selected Agricultural Occupations 2011

	General Farm Workers	Harvesting Labourers	Labourers in Food, Beverage and Tobacco Processing
% of Employers that Recruited in the Last Two Years	98%	100%	97%
% of Recruiting Employers that Experienced Hiring Difficulties	66%	79%	65%
% of Employers with Unfilled Vacancies of over Four Months	16%	0%	34%
2011 Vacancy Rate	6%	0%	5%

Source: Government of Alberta Human Services (www.alis.alberta.ca)

Increasingly, the industry has had to rely on foreign workers to meet the industry requirements. The availability of foreign workers has generally worked well for the industry, despite the complexity of the entry process.

Proposed changes by Immigration Canada with respect to foreign workers is likely to have a significant impact on the vegetable industries cost of production. Immigration Canada is imposing stricter guidelines on the minimum wage that must be paid to foreign workers. The benchmark has been adjusted to reflect the wage of skilled agricultural workers, which currently is in the range of \$19 per hour, depending on location. This is a

significantly higher base wage than the wage rates of unskilled or semi-skilled labour, which is closer to \$12-15 per hour.

This change, if implemented, will have a significant impact on the cost of vegetable production, and on the profitability of fresh vegetable production and processing in Alberta.

There were also some concerns raised by the processing sector about access to foreign labour. The reality is that the industry simply cannot afford to compete with the oil and gas industry. Another factor impacting the industry is a change in length of stay for foreign worker. A foreign worker can no longer work in Canada for more than 4 consecutive seasons. He/she can return after being away for 4 years, to continue the work cycle. This disrupts the training and skills developed by the worker and in turn represents another added training cost to the producer.

TEMPERATURE/HUMIDITY CONTROLLED STORAGE CAPACITY

Another issue facing the fresh vegetable industry is the limited capacity of the industry to provide a reliable supply of vegetables except within the short harvesting season. The reality is that there is a limitation in the form of sufficient temperature and humidity controlled storage capacity. Access to this type of storage could increase the period in which the industry could supply vegetables to the retail and food service sectors.

One example of the commercial advantage of this type of storage capacity is evidenced by the “Peak of the Market” produce cooperative in Manitoba (discussed above at page 25). The success of this venture is built on a number of factors, the most important being:

- ➔ The ability of Manitoba producers to collaborate and work together effectively within a cooperative structure, which manages the supply of vegetable crops, stores and processes vegetables, and aggressively finds and penetrates markets both in Canada and internationally.
- ➔ Strong and innovative management and marketing capacity.
- ➔ An investment in temperature and humidity controlled produce vegetable storage facility.

In addition to being a production cooperative, Peak is also a marketing commission, where all fresh production in the province must be sold through this process. At one time, Alberta had a Fresh Vegetable Marketing Board (similar to what Peak's role in Manitoba), but when this board was disbanded, the industry was no longer unified and due to its small size, the board could not be sustained independently by industry.

One of the critical success factors for Peak has been investment in a cooperative storage facility. This allows Peak to extend the marketing window for vegetable produce, thereby meeting the critical needs of retailers and food service institutions to meet consumer demand on a more year round basis.

The suggestion is made that the Alberta fresh vegetable industry should actively consider collaborating as an industry to invest in a similar type of temperature and humidity controlled facility.

TECHNOLOGY AND INNOVATION SUPPORT

There was concern, expressed by a few small scale processors who were contacted in the initial stages of this study, of the decreasing level of public sector support for processing technology development and innovation. Respondents suggested there is less technical support in terms of people, or financially, to assist industry in identifying, testing, and piloting new technologies and equipment than existed five years ago. Support is needed for new production systems and research into crops and product development most suitable for niche market opportunities.

This decline in participation is occurring at the same time as there is a growing need for the industry to develop and apply new packaging and shelf life extension technologies and equipment. A major problem facing the fresh and processed vegetables is the degree of waste that occurs due to the perishability of the product.

Some of the examples of these technologies are HTHP (High Temperature, High Pressure), retort pouch technology, and temperature controlled atmosphere packaging. There is a significant cost to the testing of these and other technologies on the companies' specific food products. The small and medium scale and financial position of most of the existing Alberta vegetable processors does not allow for undertaking this processing innovation.

The Leduc Food Processing Development Centre remains the centerpiece for the industry to undertake the development and testing of new food processing technologies. The difficulty is that the access, cost, and timing to undertake food processing development through the Centre are excessive for the small and medium sized processing entity. As well, grants for food processing development are limited, and as well technical training support has declined.

A major competitive advantage or disadvantage for the vegetable industry (and any other industry) is the relative ability and capacity to undertake applied research and development.

INDUSTRY ORGANIZATIONAL STRUCTURE

A further structural and competitive limitation of the Alberta vegetable industry is the lack of an organizational agency through which to promote and develop the industry. While the Potato Growers of Alberta still provides assistance for potatoes, the vegetable industry no longer has an association to represent itself. The previous Alberta Vegetable Growers Marketing Board stopped being active in the late 1980's.

There is however, an active Alberta Farm Fresh Producers Association (AFFPA). This organization has a membership and a mandate that is focused on farm direct production and marketing, inclusive of farmers that market through farmers' markets and local food chains. As well, there is the Alberta Farmers' Market Association, focused on the organization and regulation of farmers' markets in Alberta.

An organization that can be said to indirectly represent the industry is the Alberta Food Processors Association (AFPA). AFPA however is primarily focused on the food processing industry, and inclusive of all food processing industry segments.

The gap that exists is an organization that represents the commercial vegetable and fruit producers and processors. Such an organization, could work toward promoting and developing the industry. This industry now is fragmented, very competitive, and lacks a common voice and facility to undertake initiatives for the common good of all members, such as addressing storage gaps, and to promote the development of research and development of new processing technology and equipment.

This really is a significant issue for the sector in the long run since without a more cooperative approach there simply is not the scale necessary in order to justify additional processing capabilities. Even if many of the other issues were addressed, there is a need to ensure a larger scale, reliable production base from which processors can gain the economies of scale necessary to compete even in the niche markets that appear to be becoming a reality.

BRANDING

The "Alberta vegetable industry" is not recognized by consumers as a distinct entity or brand. There is some local branding that takes place by some local producers, but there is no significant brand that differentiates Alberta produce from others.

An example of a successful Canadian brand for vegetables is Peak of the Market in Manitoba (discussed above at pages 25 and 42). The "Peak of the Market" brand is well established across Canada, providing a level of assurance to retailers and other buyers that there is available a sustainable supply of locally produced, consistent quality vegetables. In addition to supplying other provinces, Peak exports to the US, including California, and to a lesser extent to Asia, Europe and Latin America. It is estimated that the annual sales of the company are about \$70 million.

Without an organized industry structure, the vegetable industry in Alberta has been unable to organize and reach the critical mass required to create a brand promise. An innovation that the industry might consider is to attempt to establish a vegetable value chain with a significant number of participants to produce, store, package, process and market Alberta branded vegetables. This would require a long term commitment on the part of the sector as a whole.

COST OF PRODUCTION

Developing an indication of the profitability of vegetables, potatoes and fruit was to have been the main focus of this study. In addition to the largely qualitative analysis of various competitive factors in previous sections, the primary goal of the project was to develop estimates of both revenue potential and average costs.

This goal became difficult to achieve given low participation rates by producers, to the point of requiring significant changes to the overall approach for development of benchmarks. The consulting team worked closely with ARD to adjust to this reality and enable the development of a partial set of indicators. While not as robust as summary statistics from a large sample of growers would have been, these indicators do represent a relatively solid range of potential returns for the crops where information was obtained.

The following sections outline what was initially planned, how it was adjusted, and provide a summary of the findings.

PROPOSED APPROACH

The proposed approach was to collect cost of production (COP) data from commercial vegetable producers in Alberta for the selected vegetable crops, potatoes, and fruits. This process would essentially serve two distinct purposes:

- The first objective was to provide details on the various cost elements faced by different commercial vegetables in the province;
- The second objective was to provide significant context about the nature of the industry and specifics about supply chain relationships. There is a lack of detailed data available on the sector and the intent was to use the opportunity of meeting with participants in order to discuss not only their financial information but also to collect details about the various operating realities that they face.

The plan was to interview and consult with the target vegetable producers developed from a list supplied by ARD. In the absence of an industry organization membership list that would include the majority of producers, it is believed that this list was compiled primarily from running lists maintained by ARD, with input and updates provided by ARD staff involved in the project management for both the direct market and commercial cost of production studies. It was expected that in the order of 40 to 50 producers could be used for the COP data collection, on the assumption that each producer would be able to provide a detailed cost breakdown for an average of three crops each.

The field data collection process was supposed to commence early in 2012, when the results of the 2011 crop year had been completed and available. The field data collection would have involved, for the most part, on-farm visits. The data collection system and the COP template (Excel Spreadsheet) was to have been first field tested with several producers, on the basis of which it would be adjusted and used for the larger-scale data collection process.

PROPOSED TEMPLATE

Considerable effort was put into analysing and deciding what type of technical approach and template should be used to do the field data collection. In this context, both a COP template as well as an accompanying data collection form used in the field was drafted.

The design, structure and eventual use of the COP template allowed for a dynamic approach to the data collection and its subsequent analysis and use. The proposed approach would have allowed for both the collection of the “actual” COP for 2011, allowing for a “normalized” 2011 COP to be concurrently created. As well, the flexibility for the user/producer to compare his/her own COP and financial information would be a feature of the approach.

By normalization, the intent was to provide for the flexibility to adjust for more average yields, and for the application of best management practices as applied to the use of farm inputs, cultivation, and crop protection practices. For example, it may be for some vegetable crops that the 2011 crop yield was considerably lower due to adverse crop growing conditions. Therefore, the template and analysis will allow for the use of an “adjusted” more average yield, in addition to the “actual” yield. This same flexibility for normalization will or can be applied to other cropping practices with respect to the use of fertilizer, chemicals, herbicides and cultivation practices. In addition, more standard investment and depreciation values and rates will be used, in addition to the actual values.

It was anticipated that the use of this COP template and the COP data collection form would result in more accurate and complete data being collected to support the final COP analysis. A similar approach to normalizing data has been used successfully in numerous other COP work by the consulting team.

WHAT WE DID

Unfortunately, the project ran into significant difficulties due to a lack of participation from the producers. Although, over 90 vegetable and fruit producers were contacted for this study, only eight were willing to talk about their business operations and costs of production. Out of these, only four useful interview results were picked for further research and analysis.

This problem with producer participation is not uncommon when conducting costing studies in agriculture. A key difference in this sector is the relatively small sample size, which created the issues around getting both the coverage for the desired crops as well as the numbers required so as to be able to report findings without compromising confidentiality concerns.

There has been some success in collecting data for vegetables, specifically greenhouse and direct marketers. These must be put in context in order to fully understand what the factors are that account for this difference: The greenhouse crop growers have a history of providing information annually, as they apparently see significant value in them - simple mail outs resulted in 80% response rates.

We were able to obtain some recent cost of production data obtained from Alberta producers who grow vegetable crops for farm direct marketing channels. While it was informative to receive these cost of production data for farm-direct producers, it was clear that significant adjustment would be required for that data. The primary reason for this is the different scale of operations of the (generally smaller) direct market producers. The data collected was often for less than an acre for each crop and in many cases as low as one-tenth of an acre. Many costs, especially labour and fixed costs such as machinery investment, would be expected to be vastly different at this scale than for larger commercial operations growing ten or twenty acres of a crop.

The price establishment is also different for farm direct marketers, as prices can vary significantly between locations of farmers' markets, for example. The price is dictated more by what the local market will bear than it is by wholesale prices established in larger-volume wholesale markets in other parts of North America.

Significant changes to the study process were made after it became apparent that there would be a producer participation issue. Adjustments included:

- Conducting a more significant environmental scan of other jurisdictions in order to determine the availability of COP information;
- Pursuing contacts with a number of practicing agronomists in order to solicit their input on the nature of costs in the sector for specific crops that they were familiar with; and
- Facilitating an industry workshop – similar to one that was conducted for the hemp COP work – where producers could come together in order to discuss the relevant information;

Availability of Cost of Production Budgets in other Jurisdictions

Estimates of cost of production budgets are made available to the public for a number of other crops in Alberta and other jurisdictions for a variety of reasons. These types of “budgets” are useful both to existing producers and to potential new entrants. They are used as a way to compare an operation's costs to the average within an industry, as a way to provide information for management decisions. They support decision-making on cropping, for example, by allowing a producer to obtain an estimate of both potential revenue and expected average costs for crops they have not already grown. They may also support pricing decisions, both for individual growers and for the industry as a whole, especially for smaller and niche markets (as most producers are price-takers within mainstream marketing channels).

The consulting team initiated the adjusted process by conducting a literature review for data available from other jurisdictions. While not widely available, a total of 9 jurisdictions were identified as potentially being a source of cost of production for commercial vegetables. These included areas from both Canada and the United States including:

- British Columbia
- Saskatchewan
- Manitoba
- Ontario
- California
- Idaho
- Iowa
- Kentucky
- Michigan

Some of the studies which initially appeared to provide fairly concrete and useful estimates of costs of production were found to be less informative than expected. The nature and reliability of these results varied and in virtually every case the results suffered from a lack of data points. Evidence of this problem can be seen in the standard deviations of the cost information which was typically 50% at the lowest for many cost elements.

In many cases it became clear that the “production budgets” were designed primarily to be tools for growers to calculate their own production costs. In addition, many of the more robust studies were undertaken in the mid or late 1990's. Indexing that data not only for location, but also for changes in input costs and sales prices over time would be necessary to make the information relevant to Alberta production in 2012.

A further problem is that many of the enterprise budgets developed by other jurisdictions were built based on detailed study of production practices, but at a very small scale. For example, a study conducted in Iowa for the USDA created enterprise budgets for beans, carrots, fresh peas, raspberries, strawberries and table potatoes. However, upon further analysis it became clear that it was designed primarily as a tool for growers to enter their

own data. The sample data provided in the template budget was based on a bed system of production on three very small farms over three years. The coordinators of the study were contacted and advised that the data should not be used if raising several acres of carrots, for example. When compounded with the issues of indexing for location and time, it became clear that the information sources from other jurisdictions would at best be useful as initial starting points for a future benchmarking study.

The cost of production information available in other jurisdictions and considered for use as supplementary data for the current study is summarized in the following table.

Table 26: Availability of Cost of Production Data

Crop	Canada				United States				
	British Columbia	Saskatchewan	Manitoba	Ontario	California	Idaho	Kentucky	Michigan	Iowa
Beans	2008 1996				2011				2008
Black Currants	2000								
Cabbage	2008 1998	1999					2008	2002	
Carrots	2008 1996	1999						2002	2008
Cauliflower	1998								
Cucumbers	2008 1998 1994	1999							
Fresh Peas	2008								2008
Onions	2008 1996				2011			2002	
Raspberries	2008 2007 2001			2000					2008
Saskatoons		2004	2008						
Strawberries	2008 1996 1995		2003	2000	2011				2008
Sweet Corn	2001			2008 2006			2008	2002	
Table Potatoes	2008				2008	2011	2008		2008

The single largest issue with the data was that each source took different approaches to data collection and different categories for reporting. As a result, summarizing the information in any useful fashion would have been quite difficult. The most complete source was the information from British Columbia, but there are such dramatic differences in the agronomic conditions between the Fraser Valley and Alberta, so costs would need to be interpreted with significant caution.

The 2008 Planning for Profit study from British Columbia was very broad in scope, establishing benchmark costs of production for thirty different crops, including every crop that was to be the subject of the current study. However, on closer examination of the results, it became clear that there was almost no differentiation for individual cost lines between crops. The only cost drivers that varied significantly between crops were seed, harvest labour, and miscellaneous costs. Even cost drivers such as fertilizer, pest control, and production labour did not vary at all for 28 out of the 30 crops reviewed. As with most other budgets from other jurisdictions, it was clearly designed as a tool for producers to use to establish their own cost of production, but would not be particularly reliable as a comparison to industry averages. It was decided that the BC data could therefore not be used as a reliable source for the creation of Alberta benchmarks.

Contact with Agronomists

The second adjustment involved discussion with agronomists who typically deal with vegetable growers – specifically those involved in commercial vegetables. The information that had been collected from participating producers was discussed with the agronomists and used to formulate ranges of costs that are typically seen. These individuals, despite having excellent knowledge of the industry, were somewhat hesitant to participate officially. There certainly was a fear that if identified they might be seen as providing confidential information for public use resulting in a backlash from their clients. On the other hand, they did provide sufficient information in many cases to enable the development of some excellent costing information for a more limited number of crops.

Based on the information obtained in other jurisdictions, combined with the agronomists' observations and the availability of sufficient data from Alberta growers, the focus of the project was narrowed to five crops – sweet corn, cucumbers, table potatoes, dryland carrots, and irrigated carrots.

The Workshop

The final stage in the adjusted process was to provide a forum where producers could meet and comment on the budgets that had been prepared. While individuals had not been willing to share their information it was felt that they might be willing to meet to discuss more general information. There was also the hope that some producers might actually find the concept of seeing formal cost accounting processes in action to be of interest.

A meeting was convened in Red Deer on Friday March 16. A significant marketing effort was made, but only one producer agreed to participate, perhaps partially due to short time frames. Given the fact that this producer had an excellent knowledge of the industry and actually produced a number of the crops himself the team made the decision to continue with the workshop despite the poor attendance.

The agronomists' input was tested in this workshop with producer representation. The workshop was successful, because with the help of a local producer, necessary corrections were made and estimated numbers of different costs of vegetable production were obtained.

The importance of the data in this study cannot be underestimated, because it is our opinion that they reflect the actual Alberta situation very well. The reality is that in most cases a specific market belongs to one producer, and there is no possibility to gather similar information from a number of similar producers. However, it is our opinion that the results obtained fairly estimate the reality faced by growers of the subject product.

Nonetheless, the data provided in this research should not be open to the public – the number of producers is so small that it makes it easy to identify which producer is behind the data. On the other hand, this data is an excellent source for making inside or closed analyses and for drawing general conclusions about the current situation in the Alberta vegetable industry.

FINDINGS

Field vegetable producers approached for other studies have generally been very willing to participate in research, to share their experience and history in an industry they believe strongly in. In early 2012, Serecon was undertaking several other projects, both for Agriculture and Rural Development and several other clients. When speaking with producers about marketing channels, financial risks, or industry challenges, they are generally eager to participate and very open to sharing their insights. However, when approached to also participate in the Cost of Production study, they were either hesitant or even completely unwilling to participate.

The reasons given by producers for not participating varied and could generally be aggregated into the following categories:

- the grower was not in the commercial field vegetable or fruit business
- cost of production data not known or itemized for their operation
- lack of interest in participating (some growers stated that they do not find COP data useful)
- previous participation in a similar study
- other logistical reasons (bad timing, insufficient time, duplication of effort)

Despite the small sample size, there were a number of factors that became apparent in the interviews. Perhaps, the biggest insight was that many producers' records of costs were not detailed, perhaps reflecting less focus on or knowledge about the benefits of cost-based accounting. Another reason may be that producers are afraid of the leaking of their records.

One of the most interesting findings resulting from the workshop and conversations with other growers in the course of this and other studies was the difficulty in getting producers in this sector to talk amongst their peers. The participant in the workshop was very clear about the fact that growers who are in the commercial vegetable industry tend to work in isolation for the most part and typically do not wish to communicate with each other about specific cost issues.

There is a clear indication that producers are afraid to make their data available due to the extent of competition in the sector. Some feel that disclosing detailed cost information will give advantage to their competitors. There appears to be a significant imbalance between the larger more powerful commercial growers and smaller vegetable producers. In general, an industry-wide desire to maintain competitive advantage seems to be perceived to outweigh the potential benefits obtained by sharing cost of production data amongst industry participants.

In addition, there is the reality that in some cases certain costs may not affect the decision-making process. For example, certain operations may require special machinery and it does not depend on the size of a farm. Whether the machine costs are \$10/acre or \$100/acre is irrelevant, unless it can be shared between producers, thereby reducing the per acre cost.

Another important aspect is that the numbers and volumes vary between different producers because there is no common reporting standard for the industry. It is not easy to design budgets that would fit easily to every producer regardless of the size of their operation or crops grown.

COST OF PRODUCTION ANALYSIS

We have prepared one worksheet for each of the five vegetable crops where sufficient information was available to prepare a detailed cost of production estimate.

The types of costs were divided between 1) the variable costs (includes costs like seed, fertilizers, chemicals, irrigation, various transportation costs, labour costs etc.); and 2) the fixed costs, which include mainly costs connected with machinery, buildings, management and land.

For ease of reference and comparison between crops, a summary is provided in this section for each of the subject crops. Appendix A contains the full details of the cost of production estimates.

Sweet Corn

Variable costs

Variable costs for producing sweet corn amounted to \$1,789 per acre. Among all the variable costs, cardboard costs were the highest at \$500 per acre, followed by general labour \$220 per acre and electricity costs \$200 per acre. A detailed breakdown of these costs is presented in Table 27.

Fixed costs

The highest cost under fixed costs is management costs at \$500 followed by machine depreciation costs and land rent costs at \$320 and \$200 per acre respectively. The lowest costs were machine housing costs at \$5 per acre, insurance costs for buildings at \$20 per acre, and insurance for machinery at \$40 per acre.

Total Production Costs

Total production costs for sweet corn amounted to \$3,104 per acre. Figure 17-19 and Appendix A.1 show the breakdown of costs for sweet corn production.

Table 27: Cost of Production for Sweet Corn

	Cost (\$/acre)	Total Cost 10 acres
GROSS REVENUE	3,500.00	35,000.00
VARIABLE COSTS		
Seed	55.00	550.00
Fertilizer	138.18	1,381.80
Herbicide	25.00	250.00
Fungicide/Insecticide	45.00	450.00
Fuel, Oil & Lube	60.00	600.00
Machinery Repairs	50.00	500.00
Freight & Packaging	625.00	6,250.00
Labour	220.00	2,200.00
Irrigation	73.00	730.00
Utilities	220.00	2,200.00
Operating Interest	85.55	855.50
Other Expenses	192.19	1,921.86
TOTAL VARIABLE COST	1,788.92	17,889.16
FIXED COSTS		
Machinery	460.00	4,600.00
Building	154.90	1,549.00
Management	500.00	5,000.00
Land Rent	200.00	2,000.00
TOTAL FIXED COST	1,314.90	13,149.00
TOTAL COST	3,103.82	31,038.16
CONTRIBUTION MARGIN	\$ 1,711.08	\$ 17,110.84
NET RETURN	\$ 396.18	\$ 3,961.84

Figure 17: Net Returns and Costs for Sweet Corn

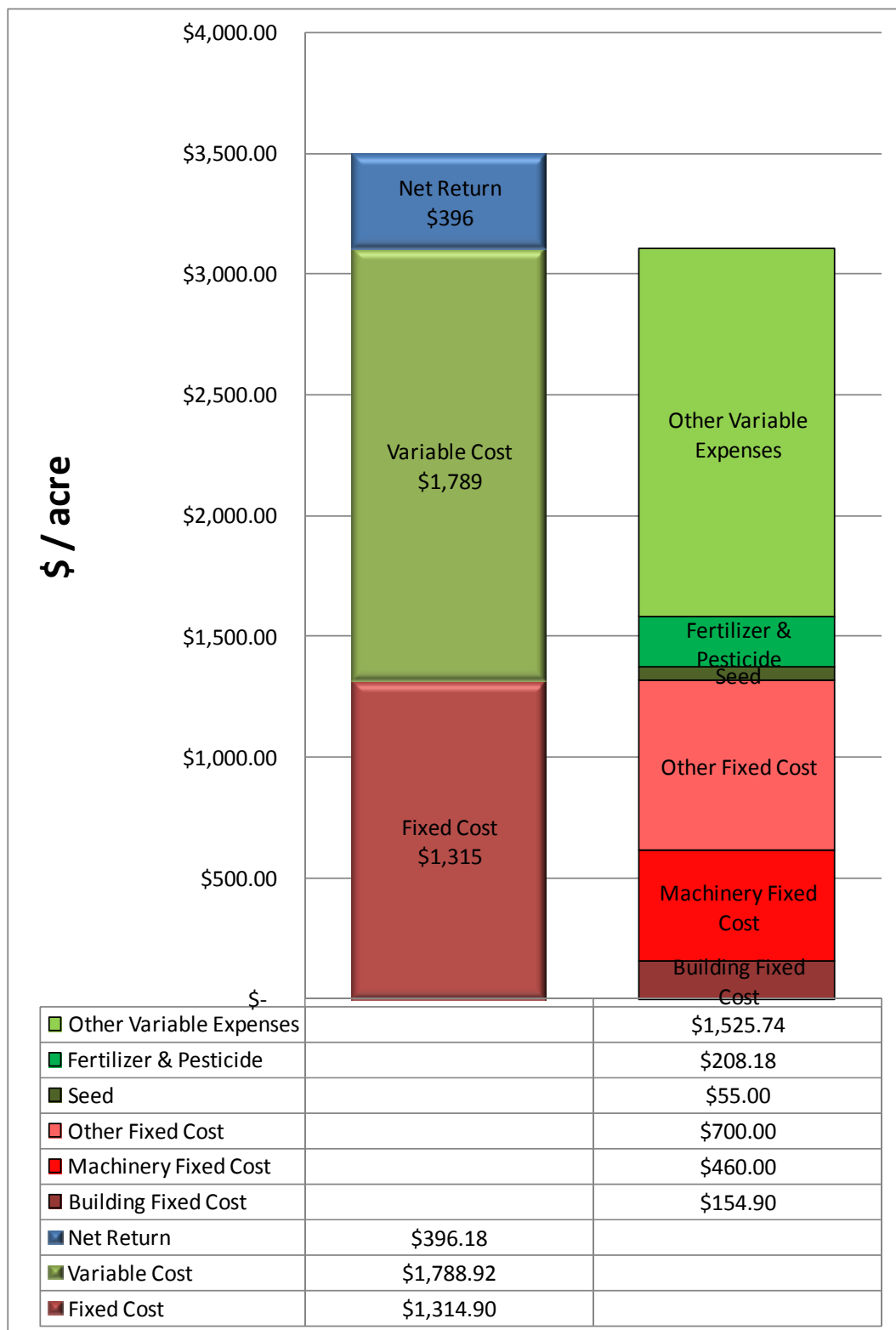


Figure 18: Variable Costs for Sweet Corn

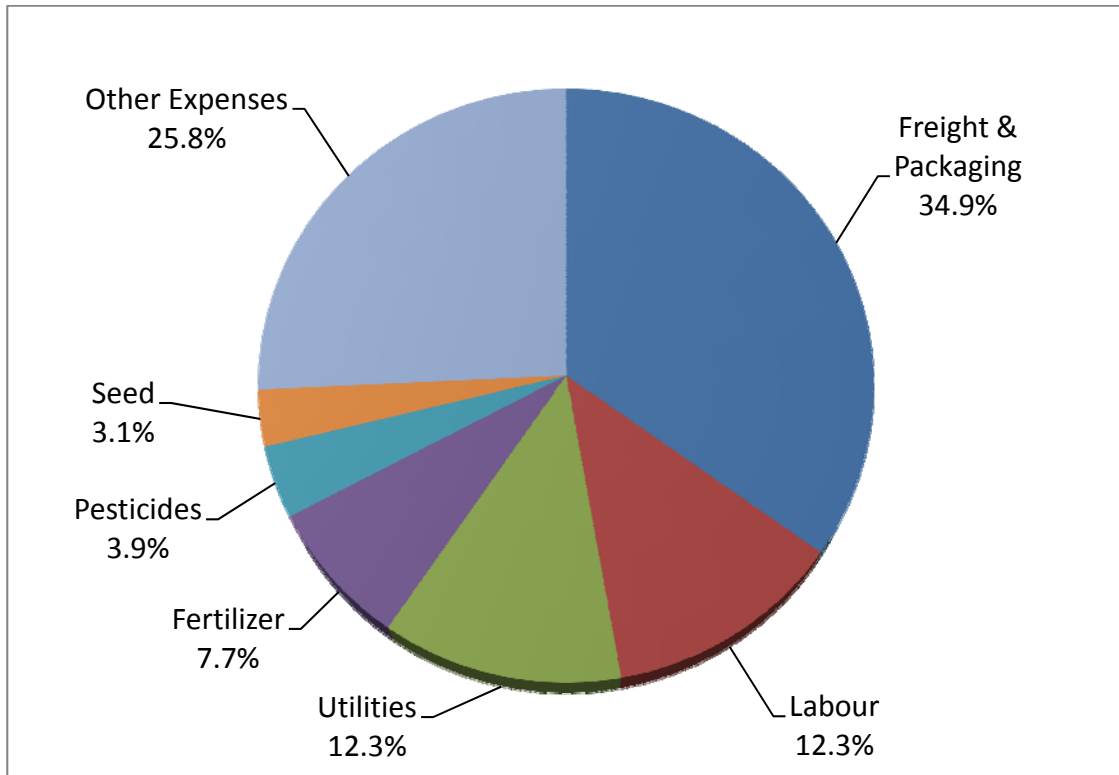
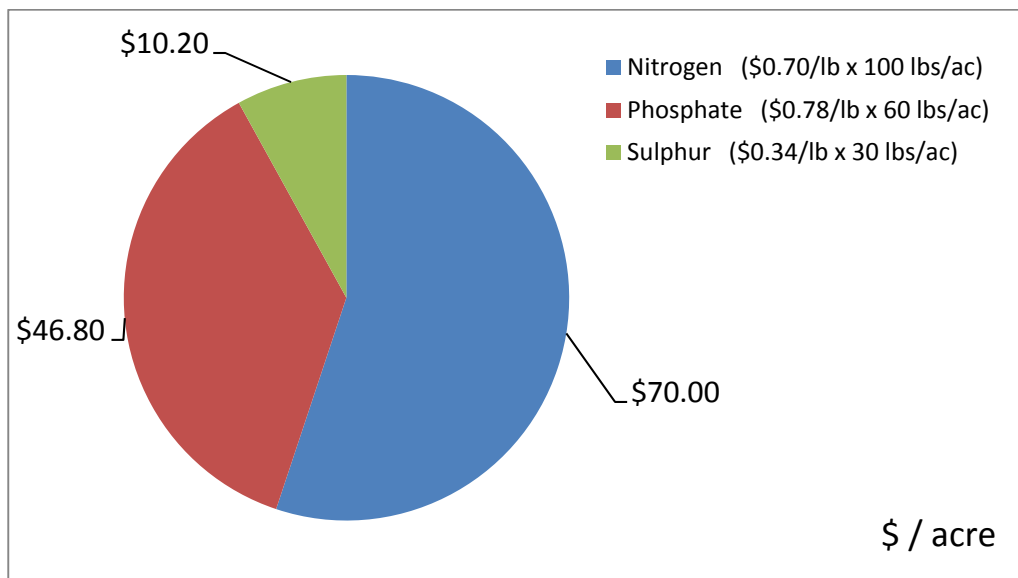


Figure 19: Fertilizer Costs for Sweet Corn



Cucumbers

Variable costs

Variable costs amounted to \$4,336 per acre for cucumbers. The most significant cost items for cucumbers production were hired labour costs at \$1,650 per acre followed by cardboard costs at \$1,200 and custom hauling at \$300 per acre. Detailed breakdown of all variable costs are presented in Table 28.

Fixed costs

The fixed costs for cucumber production were \$1,660 per acre. The highest cost was machine depreciation cost of \$560 per acre, followed closely by management costs at \$500 per acre. Figures 20-22 and Appendix A.2 break down the costs for cucumber production.

Table 28: Cost of Production for Cucumbers

	Cost (\$/acre)	Total Cost 10 acres
GROSS REVENUE	6,000.00	60,000.00
VARIABLE COSTS		
Seed	17.00	170.00
Fertilizer	138.18	1,381.80
Herbicide	35.00	350.00
Fungicide/Insecticide	45.00	450.00
Fuel, Oil & Lube	65.00	650.00
Machinery Repairs	65.00	650.00
Freight & Packaging	1,500.00	15,000.00
Labour	1,650.00	16,500.00
Irrigation	73.00	730.00
Utilities	220.00	2,200.00
Operating Interest	214.05	2,140.50
Other Expenses	313.46	3,134.61
TOTAL VARIABLE COST	4,335.69	43,356.91
FIXED COSTS		
Machinery	805.00	8,050.00
Building	154.90	1,549.00
Management	500.00	5,000.00
Land Rent	200.00	2,000.00
TOTAL FIXED COST	1,659.90	16,599.00
TOTAL COST	5,995.59	59,955.91
CONTRIBUTION MARGIN	\$ 1,664.31	\$ 16,643.09
NET RETURN	\$ 4.41	\$ 44.09

Figure 20: Net Returns and Costs for Cucumbers

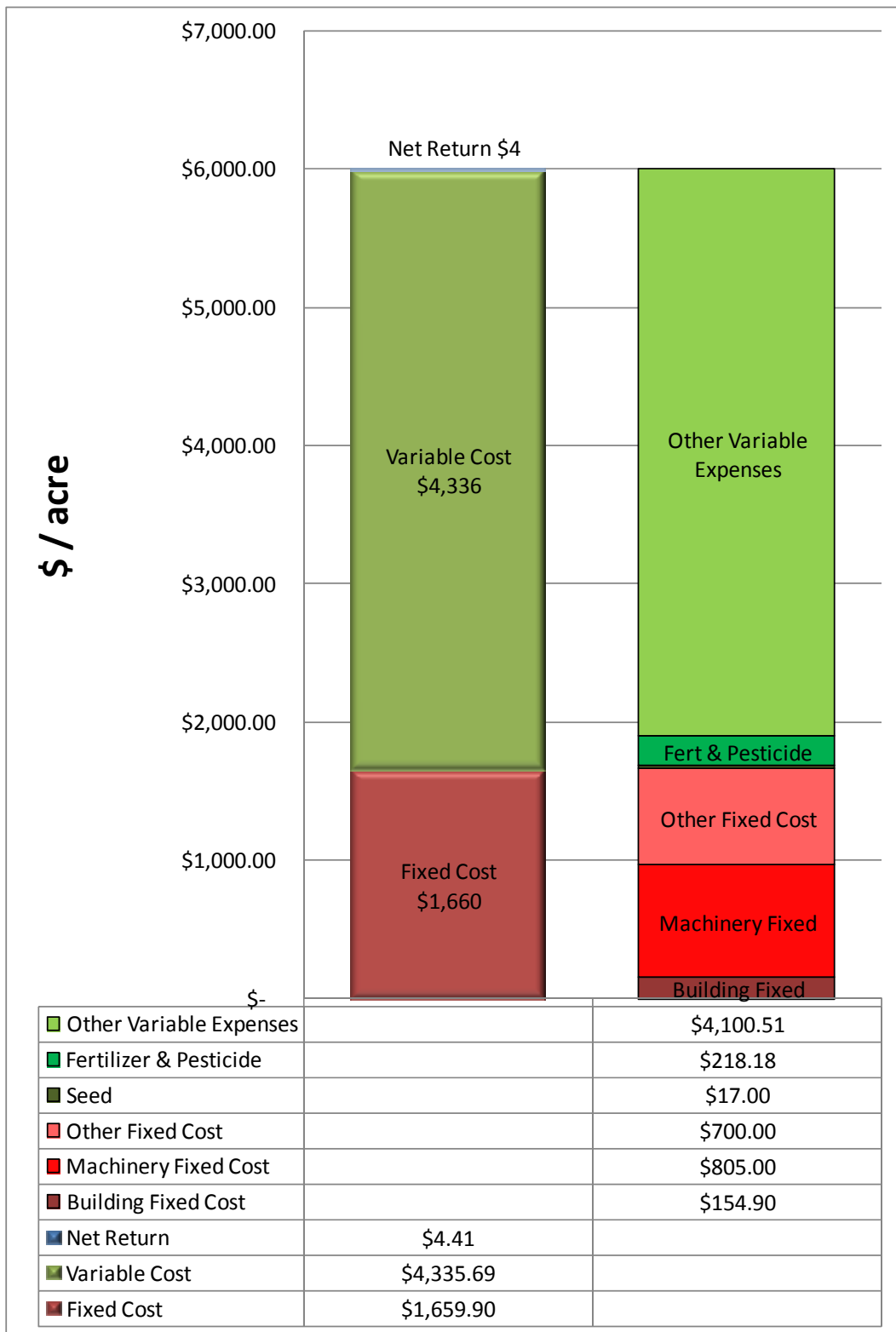


Figure 21: Variable Costs for Cucumbers

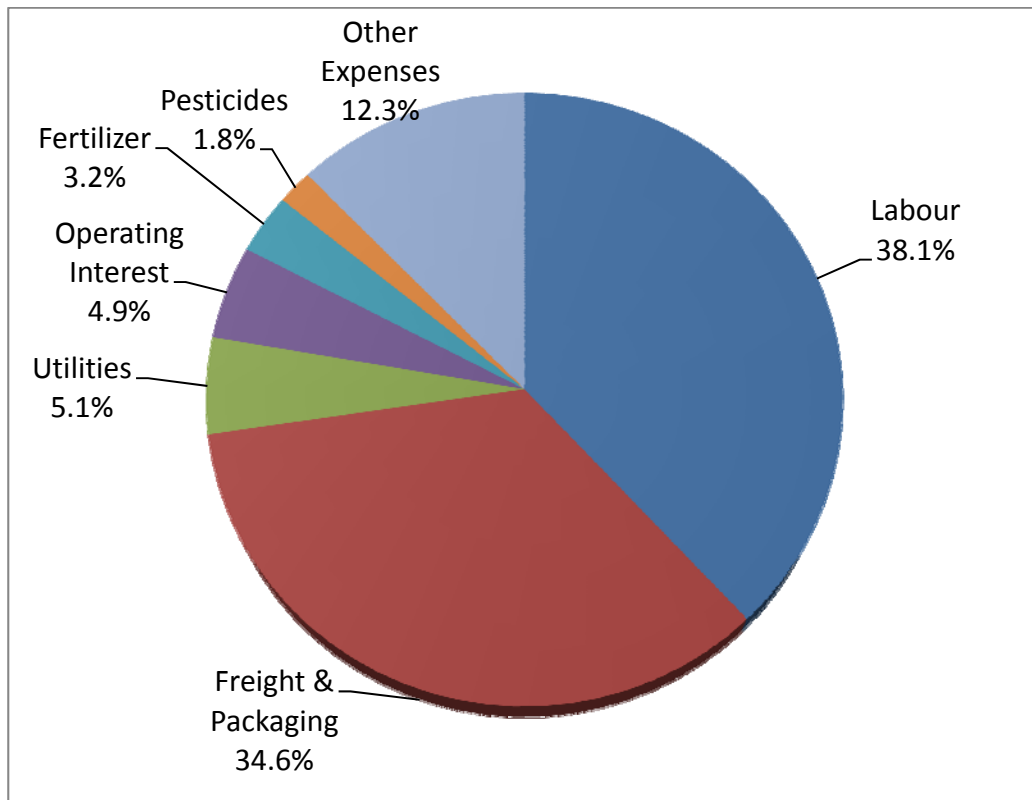
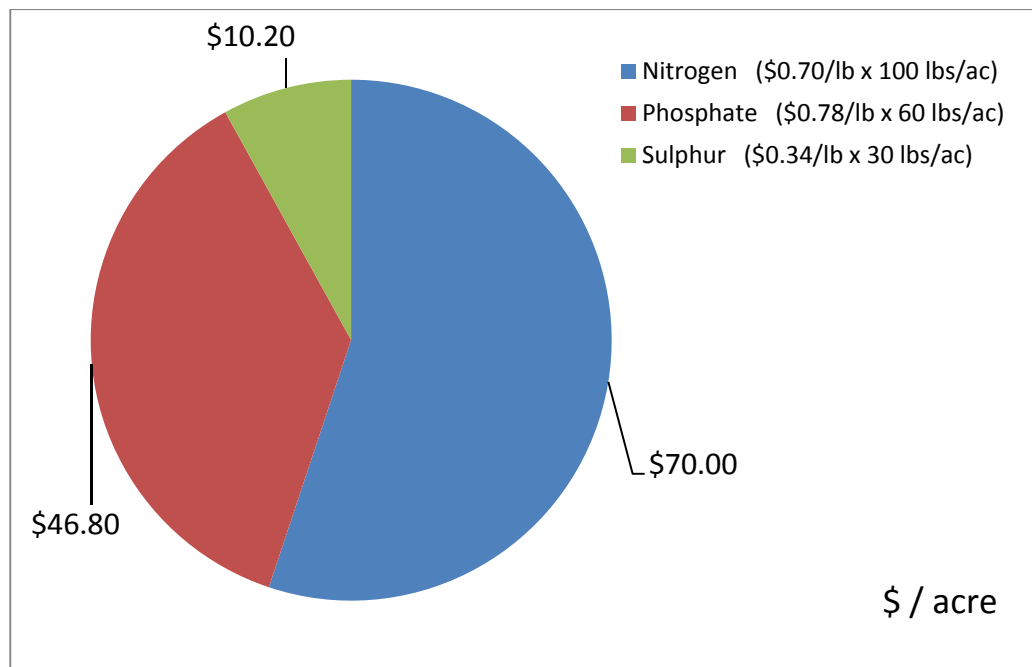


Figure 22: Fertilizer Costs for Cucumbers



Fresh Potatoes

Variable costs

Total variable cost for production of fresh potatoes was \$1,765 per acre. The highest variable cost was the potato seed cost at \$327 per acre, including treatment and hauling. This was followed by pesticide and fertilizer costs of \$312 and \$249 per acre respectively. The custom hauling harvesting costs at \$185 per acre, labour costs at \$144 per acre and machine repair costs at \$140 were the other highest costs in the list of variable costs. Detailed breakdown of all variable costs are presented in Table 29.

Fixed costs

Altogether, the fixed costs of potato production were \$750 per acre. The highest was the land rent cost at \$300 per acre. Other major fixed costs were the depreciation of machinery at \$147 per acre and building depreciation at \$84 per acre. Figures 23-25 and Appendix A.3 show the breakdown of costs for fresh table potato production.

Table 29: Cost of Production for Fresh Potatoes

	Cost (\$/acre)	Total Cost 380 acres
GROSS REVENUE	2,400.00	912,000.00
VARIABLE COSTS		
Seed	326.89	124,218.20
Fertilizer	248.83	94,555.40
Herbicide	51.71	19,647.90
Fungicide/Insecticide	260.20	98,874.10
Fuel, Oil & Lube	100.00	38,000.00
Machinery Repairs	140.00	53,200.00
Freight & Packaging	184.80	70,224.00
Labour	144.00	54,720.00
Irrigation	79.00	30,020.00
Utilities		-
Operating Interest	86.71	32,951.13
Other Expenses	143.06	54,361.54
TOTAL VARIABLE COST	1,765.19	670,772.27
FIXED COSTS		
Machinery	211.84	80,500.00
Building	162.79	61,862.00
Management	75.00	28,500.00
Land Rent	300.00	114,000.00
TOTAL FIXED COST	749.64	284,862.00
TOTAL COST	2,514.83	955,634.27
CONTRIBUTION MARGIN	\$ 634.81	\$ 241,227.73
NET RETURN	\$ (114.83)	\$ (43,634.27)

Figure 23: Net Returns and Costs for Fresh Potatoes

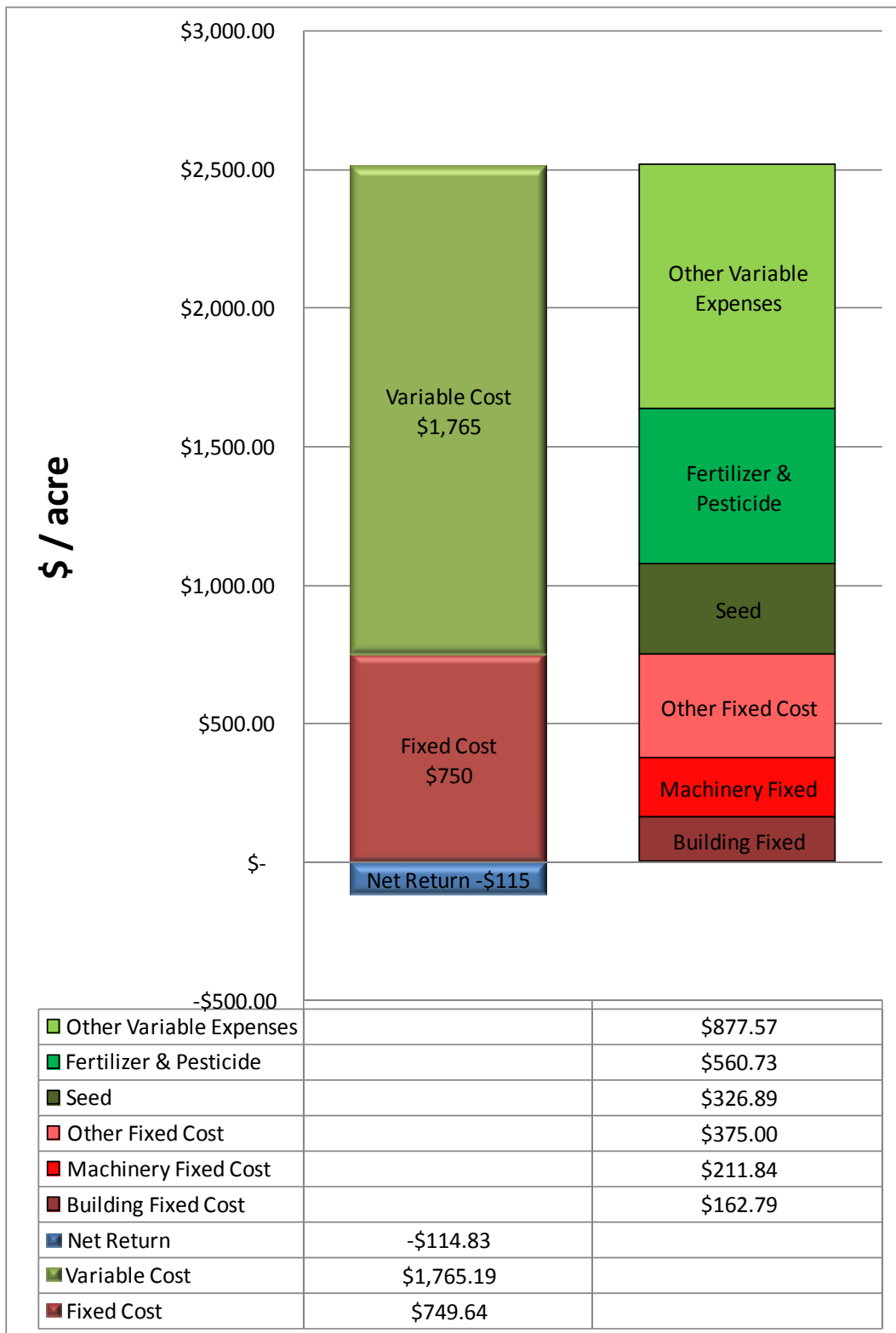


Figure 24: Variable Costs for Fresh Potatoes

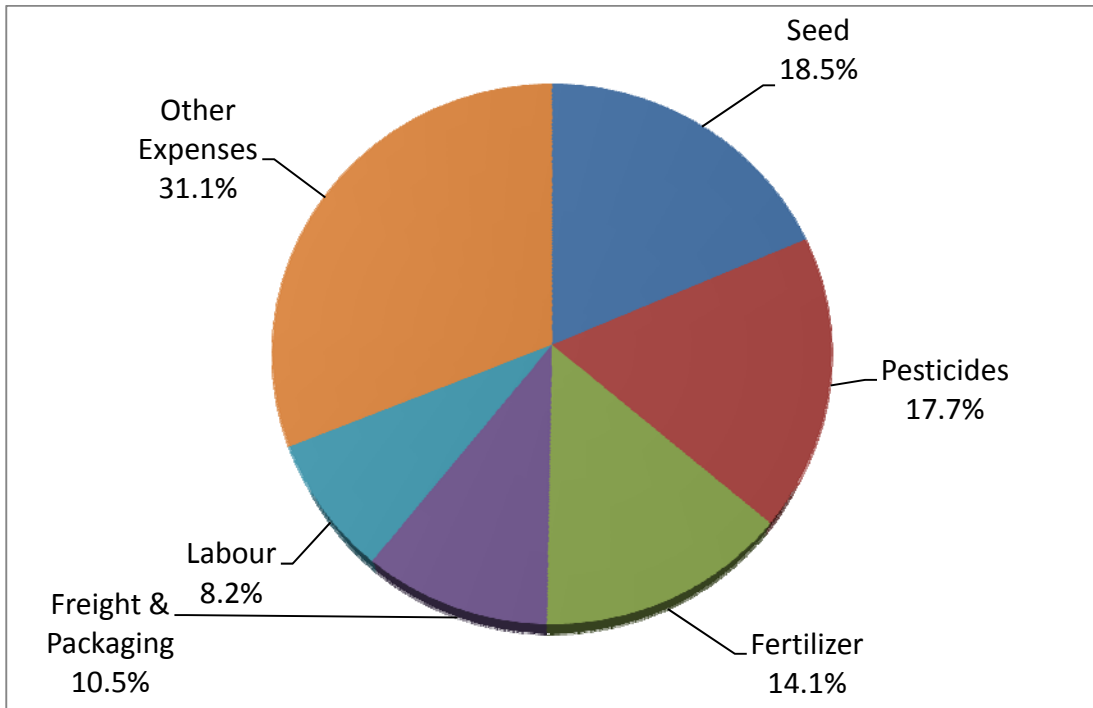
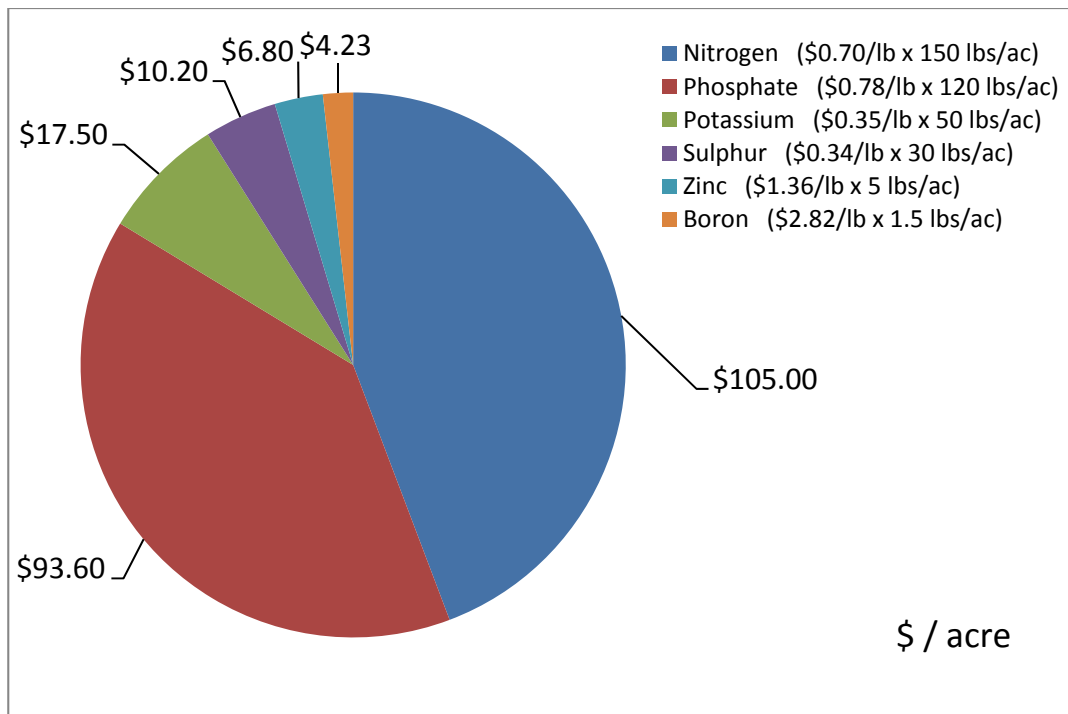


Figure 25: Fertilizer Costs for Fresh Potatoes



Dryland Carrots

The estimation of carrot production costs distinguishes between the carrots produced in central Alberta without irrigation (“dryland carrots”) and those produced under center pivot irrigation (“irrigated carrots”).

Variable Costs

The total variable costs for carrot production in central Alberta were at \$1,194 per acre. The total cost for seed was \$400 per acre. Custom hauling and cardboard were the next highest set of costs at \$173 per acre, followed by fertilizer at \$159 per acre. All other costs beside the \$97 per acre labour were lower than \$71 per acre. Detailed breakdown of all variable costs are presented in Table 30.

Fixed Costs

The total fixed costs for dryland carrots are \$577 per acre. The highest costs are the machine depreciation costs at \$192 per acre and the management costs of \$150 per acre. Figures 26-28 and Appendix A.4 show the breakdown of costs for carrot production in central Alberta.

Table 30: Cost of Production for Dryland Carrots

	Cost (\$/acre)	Total Cost 125 acres
GROSS REVENUE	1,800.00	225,000.00
VARIABLE COSTS		
Seed	400.00	50,000.00
Fertilizer	159.23	19,903.75
Herbicide	35.00	4,375.00
Fungicide/Insecticide	35.00	4,375.00
Fuel, Oil & Lube	40.00	5,000.00
Machinery Repairs	50.00	6,250.00
Freight & Packaging	173.25	21,656.25
Labour	96.84	12,105.00
Irrigation	-	-
Utilities	50.00	6,250.00
Operating Interest	59.55	7,443.75
Other Expenses	94.84	11,855.44
TOTAL VARIABLE COST	1,193.71	149,214.19
FIXED COSTS		
Machinery	276.00	34,500.00
Building	51.00	6,375.00
Management	150.00	18,750.00
Land Rent	100.00	12,500.00
TOTAL FIXED COST	577.00	72,125.00
TOTAL COST	1,770.71	221,339.19
CONTRIBUTION MARGIN	\$ 606.29	\$ 75,785.81

Figure 26: Net Returns and Costs for Dryland Carrots

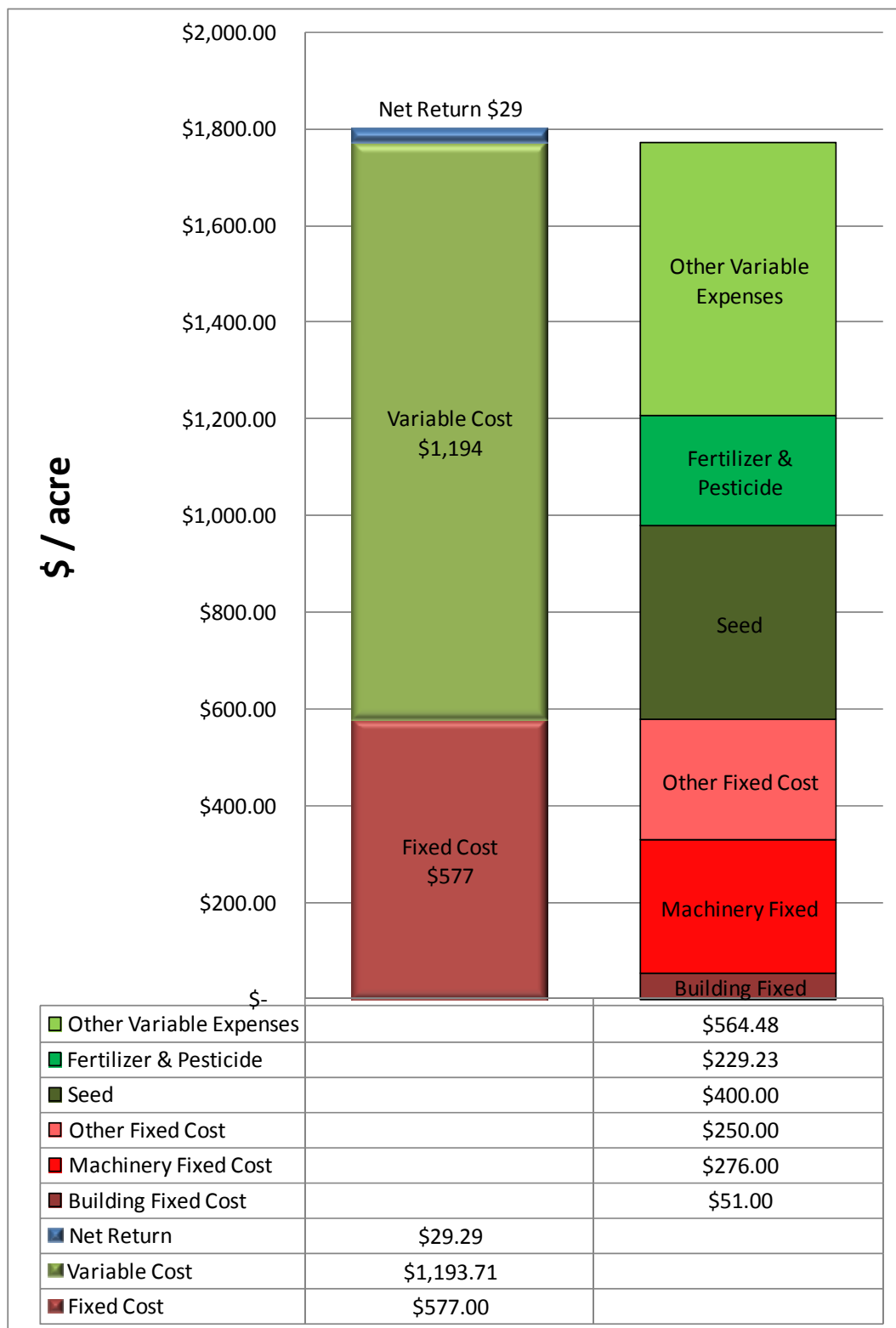


Figure 27: Variable Costs for Dryland Carrots

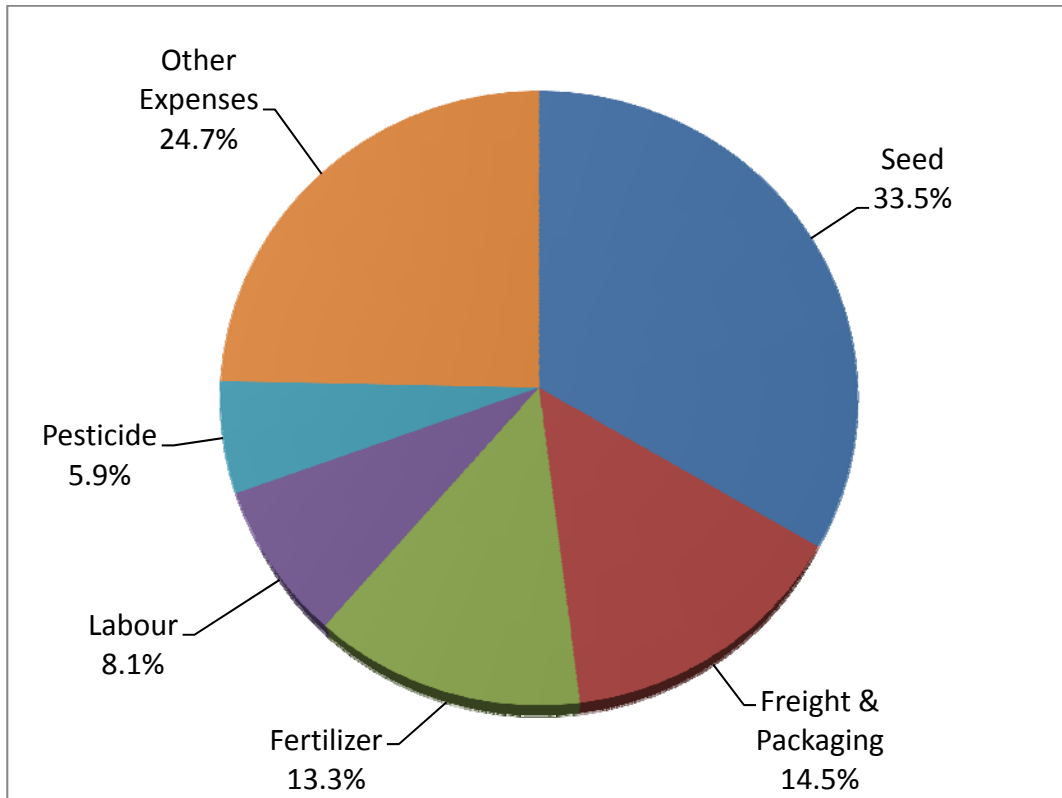
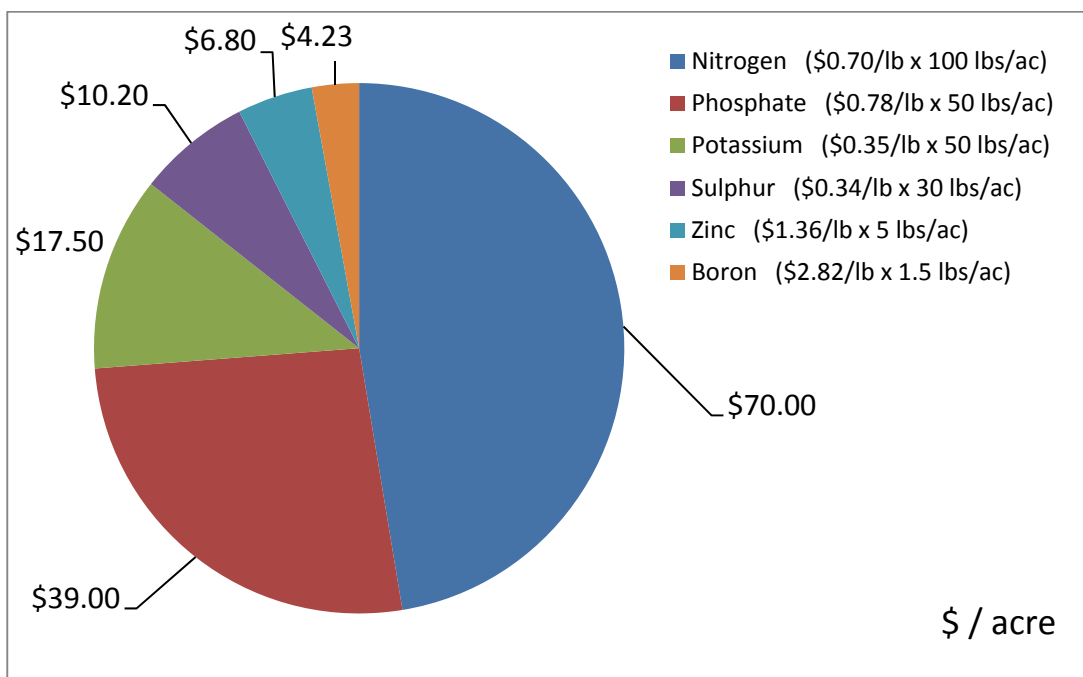


Figure 28: Fertilizer Costs for Dryland Carrots



Irrigated Carrots

Variable Costs

Irrigated carrot production is slightly different from dryland costs. Total variable costs for irrigated production were \$1,480 per acre. The two highest costs are still the seed costs at \$400 per acre, and costs of custom hauling at \$243 per acre, but there was also a third additional type of costs – the cost of adding nitrogen at \$105 per acre and the costs of phosphate (dry) at \$94 per acre. A detailed breakdown of all variable costs for irrigated carrots is presented in Table 31.

Fixed Costs

The total fixed costs for producing irrigated carrots was at \$726 per acre. The costs which were the highest were the land rent costs at \$250 per acre, machine depreciation costs at \$192 per acre and finally the management costs at \$150 per acre. Figures 29-31 and Appendix A.5 break out the costs of irrigated carrot production.

Table 31: Cost of Production for Irrigated Carrots

	Cost (\$/acre)	Total Cost 125 acres
GROSS REVENUE	2,520.00	315,000.00
VARIABLE COSTS		
Seed	400.00	50,000.00
Fertilizer	248.83	31,103.75
Herbicide	35.00	4,375.00
Fungicide/Insecticide	35.00	4,375.00
Fuel, Oil & Lube	40.00	5,000.00
Machinery Repairs	50.00	6,250.00
Freight & Packaging	242.55	30,318.75
Labour	96.84	12,105.00
Irrigation	79.00	9,875.00
Utilities	50.00	6,250.00
Operating Interest	70.65	8,831.25
Other Expenses	132.49	16,561.69
TOTAL VARIABLE COST	1,480.36	185,045.44
FIXED COSTS		
Machinery	276.00	34,500.00
Building	49.90	6,237.50
Management	150.00	18,750.00
Land Rent	250.00	31,250.00
TOTAL FIXED COST	725.90	90,737.50
TOTAL COST	2,206.26	275,782.94
CONTRIBUTION MARGIN	\$ 1,039.64	\$ 129,954.56

Figure 29: Net Returns and Costs for Irrigated Carrots

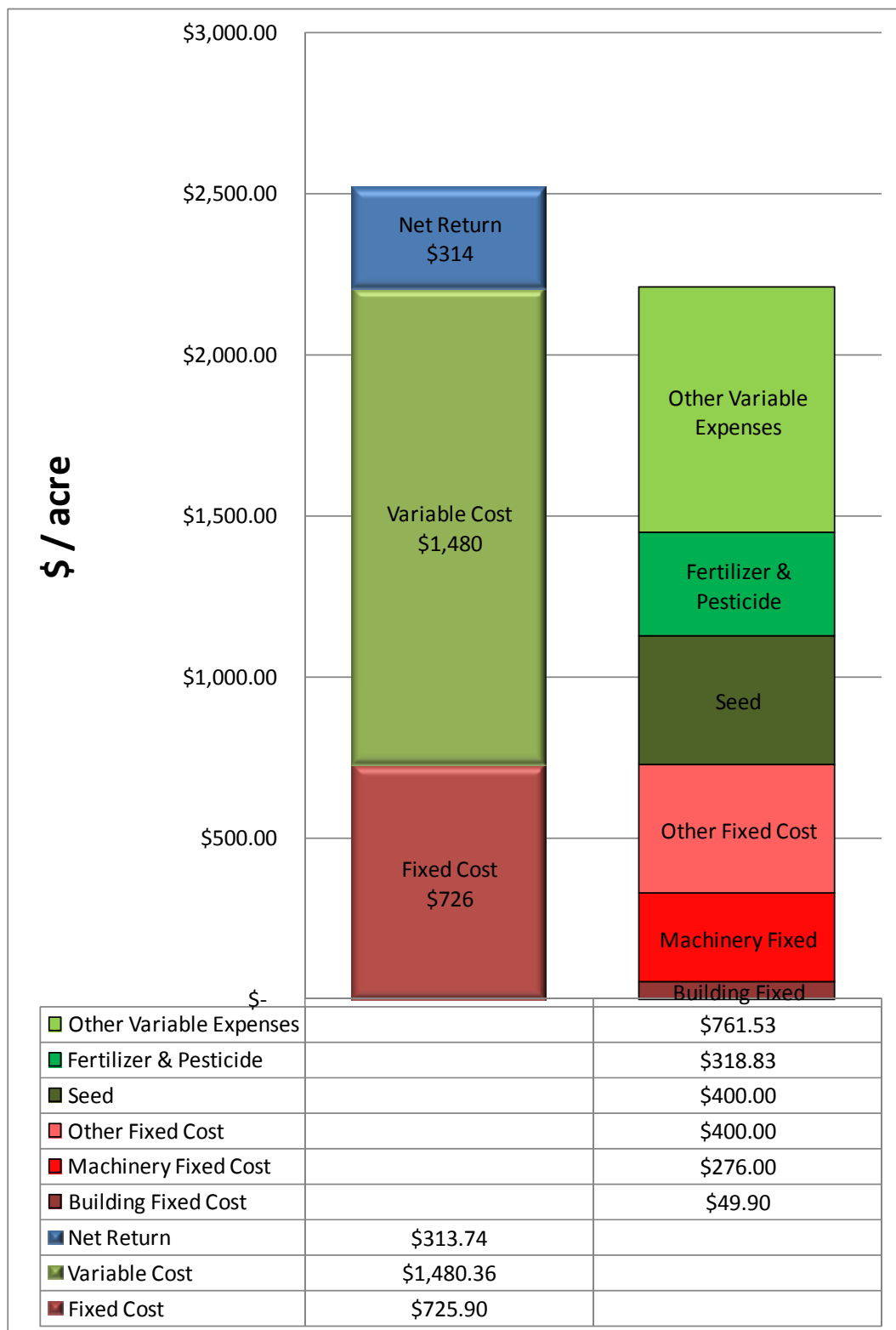


Figure 30: Variable Costs for Irrigated Carrots

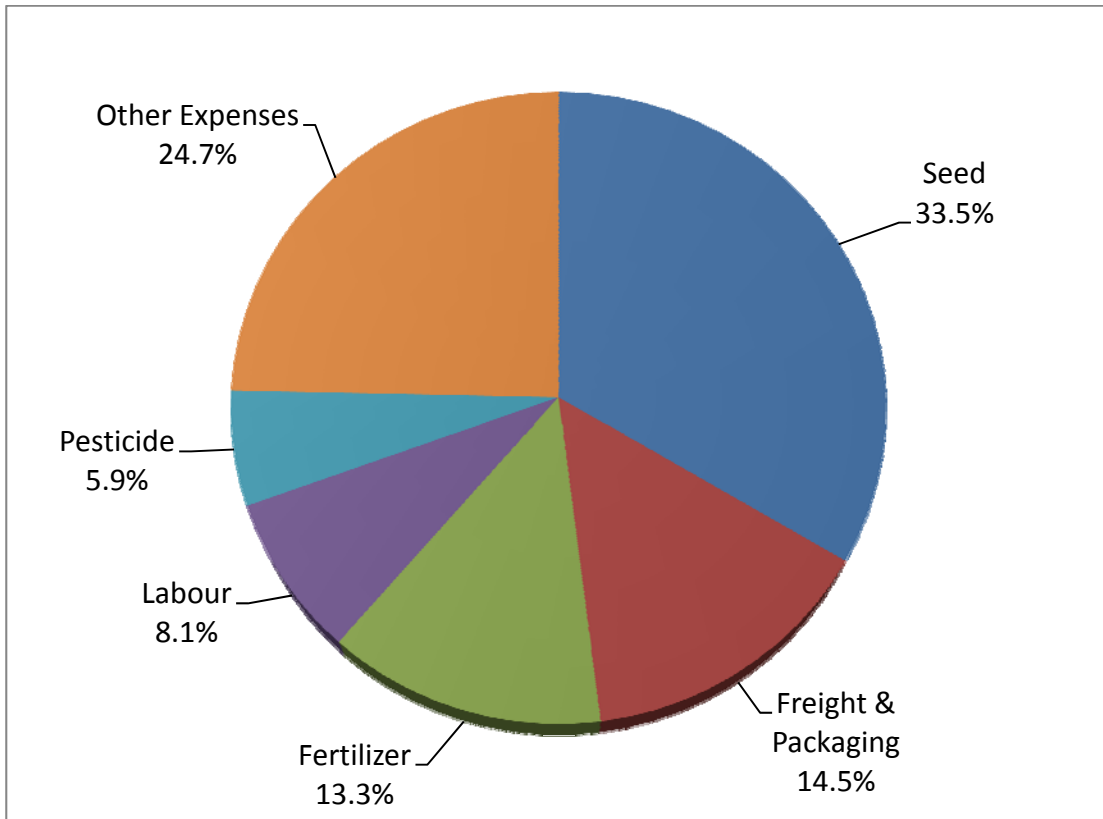
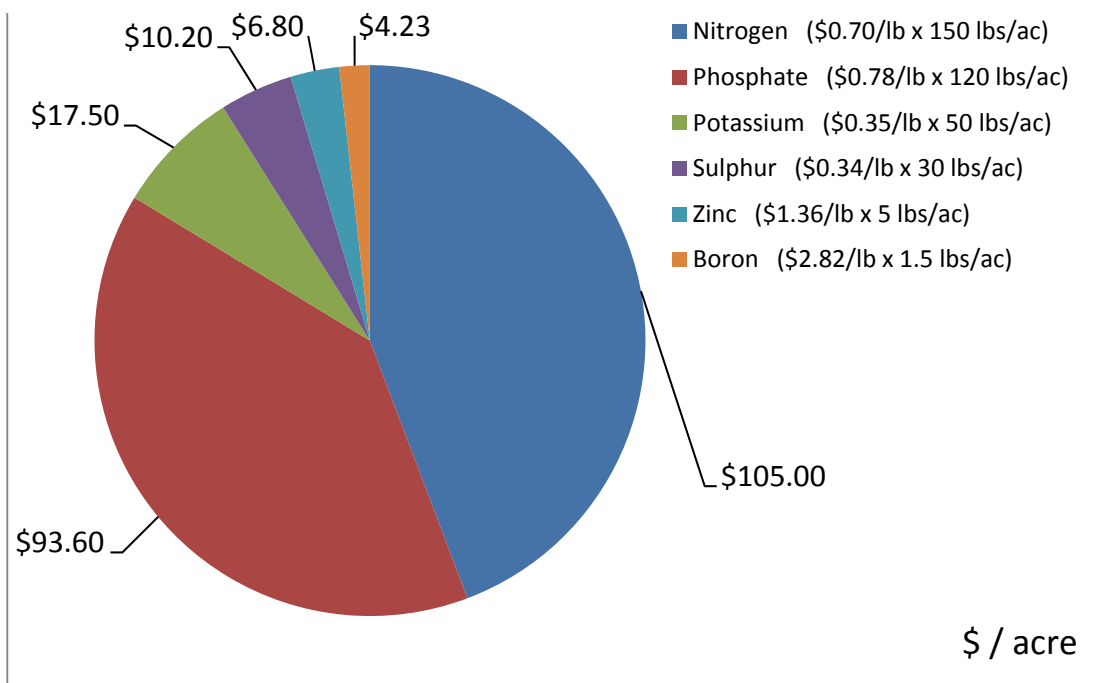


Figure 31: Fertilizer Costs for Irrigated Carrots



Saskatoons, Black Currants, and Strawberries

Initially, this study was to also have developed cost of production budgets for saskatoons, black currants, and strawberries.

For black currants and strawberries, we were not able to locate any detailed secondary data sources. While British Columbia did develop a cost of production factsheet for black currants as part of their “Planning for Profit” fact sheet series in the year 2000, the data cannot readily be adapted for Alberta. This is largely due to the significantly different production realities in the Lower Fraser Valley, but also due to the different processing capacity and resulting sales prices in Alberta. The costs of production for these crops is further complicated by their multi-year nature. Unlike the primarily annual production of fresh vegetables, many of the costs of producing these crops are borne in the initial year, while revenue generation varies significantly over the two to ten year production period.

For saskatoon berries, ARD did develop a fairly comprehensive assessment of the costs of production in 2008. Unfortunately, we were not able to get primary data to refine, update or even corroborate that data. However, since the data is relatively recent, the cost of production benchmarks contained in that study may be very useful to the readers of this report. The data can be found in the ARD document *Economics of Saskatoon Berry Production: A Ten Acre Enterprise*, Agdex 238/821-2.

The study concluded that significant establishment costs were incurred over the first three years of production of saskatoons, without any revenue being generated. However, even the first year of production (the fourth year of the crop), showed a positive contribution margin based on gross revenue of \$1,146 per acre. The gross operating profit became positive in year five (annual gross revenue of \$2,866 per acre) and net profitability was reached by year six (annual gross revenue in year six was estimated at \$5,732 per acre and \$7,165 for all future years of the mature orchard).

The most significant cost for saskatoon production over the first three establishment years were plant material (\$6,725 per acre spread over three years). The other significant annual costs over those first three years were custom work (\$199/ac/yr), chemicals (\$137/ac/yr) and labour (\$118/ac/yr).

As with the revenue profile, the cost estimates also changed drastically in the fourth year of a crop. The most significant cost was depreciation (an average of \$492 per acre per year). The most significant cash costs were labour (\$344/ac/yr), equipment operation and maintenance (\$259/ac/yr), chemicals (\$107/ac/yr), and fertilizer (\$95/ac/yr).

SUMMARY AND CONCLUSIONS

Commercial vegetable production in Alberta would appear to be profitable for a limited number of participants that have well established marketing channels, but it is difficult to draw conclusions on how this success might translate more generally across Alberta's vegetable industry.

On one hand, Alberta has a productive land base, and the success of the processing potato industry clearly demonstrates that a processor driven model can be successful. On the other hand, there are a number of factors that have limited the motivation of large scale processors to move into the province including a relatively high cost structure relative to the total productive capacity given the agronomic reality faced by production in a northern climate.

Industry initiatives have been successful in other provinces, but this has been a result of a significant formal coordination between those involved in production, storage, processing and packaging. At this point in time there does not appear to be strong motivation by current industry participants to engage in this type of coordinated activity.

COSTS OF PRODUCTION

In terms of assessing relative profitability, a detailed cost of production comparison between the five vegetables is presented in Figure 32 and Table 32. These results indicate that contribution margins for the eight vegetables ranged from a low of \$606 per acre to a high of \$2,223 per acre.

The seed cost was highest for carrot production at \$400 cost per acre and lowest for cucumber production at \$17 per acre. Fertilizer costs were the highest for carrots under irrigated production but were much lower for dryland carrot production in central Alberta at \$147. The fertilizer cost for potatoes were \$249, approximately the same as for irrigated carrots production.

Another important cost category was packaging and freight to wholesaler, which was highest for cucumbers at over \$1,500 per acre. Containers and cardboard were not needed in every category, but were important costs for cucumbers at \$1,200 per acre.

The repair & maintenance for machinery was the highest for fresh potato production at \$140 per acre.

The labour costs varied significantly although cucumber production was highest at \$1,650 per acre and lowest for carrots at just under \$100 per acre.

Contribution Margin

Contribution margin is commonly used as a measure of marginal profit generated by a crop, and is calculated by subtracting the variable costs for that crop from its gross revenue.

Cucumbers had the highest variable costs at \$4,337 per acre, being over three times higher than the dryland carrots which had the lowest variable costs at \$1,194 per acre. However, the expected revenue was also much higher, at 600 boxes per acre at \$10 per box, resulting in cucumber having the second-highest contribution margin.

Sweet corn and cucumbers had the highest relative contribution margins in the series at over \$1,600 per acre. The lowest contribution margins were in dryland carrots and fresh potatoes at just over \$600 per acre. Low sales profit for these crops appear to be the main issues related to profitability.

Figure 32: Gross Revenue, Variable Costs and Contribution Margins

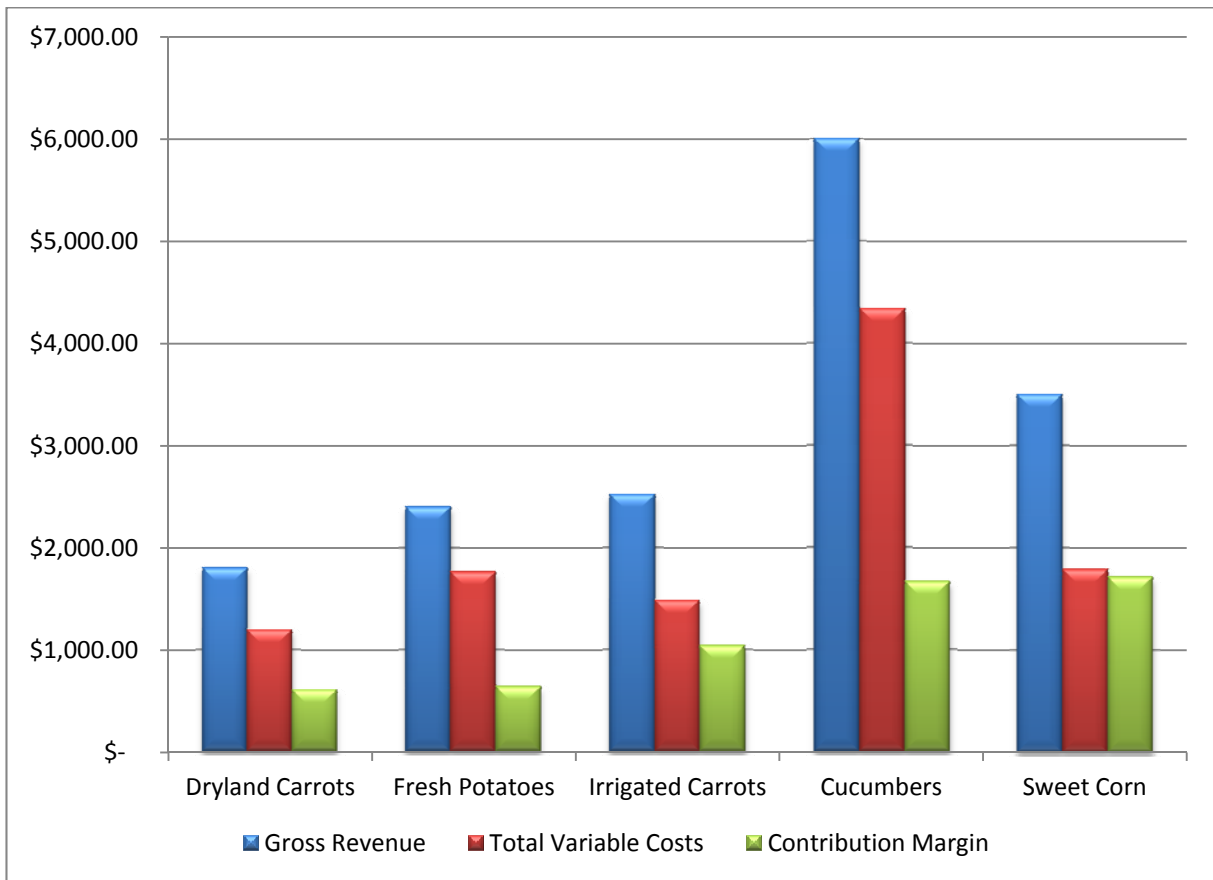


Table 32. Comparison of Crop Sales, Variable Costs and Contribution Margin Between Eight Chosen Crops

	Dryland Carrots	Fresh Potatoes	Irrigated Carrots	Cucumbers	Sweet Corn
Expected Market Price	\$120 /t	\$150 /t	\$120 /t	\$10 /box	\$14 /box
Expected Yield	15 t	16 t	21 t	600 boxes	250 boxes
GROSS REVENUE	\$ 1,800.00	\$ 2,400.00	\$ 2,520.00	\$ 6,000.00	\$ 3,500.00
VARIABLE COSTS					
Seed	400.00	326.89	400.00	17.00	55.00
Fertilizer	159.23	248.83	248.83	138.18	138.18
Herbicide	35.00	51.71	35.00	35.00	25.00
Fungicide/Insecticide	35.00	260.20	35.00	45.00	45.00
Fuel, Oil & Lube	40.00	100.00	40.00	65.00	60.00
Machinery Repairs	50.00	140.00	50.00	65.00	50.00
Freight & Packaging	173.25	184.80	242.55	1,500.00	625.00
Labour	96.84	144.00	96.84	1,650.00	220.00
Irrigation	-	79.00	79.00	73.00	73.00
Utilities	50.00		50.00	220.00	220.00
Operating Interest	59.55	86.71	70.65	214.05	85.55
Other Expenses	94.84	143.06	132.49	313.46	192.19
TOTAL VARIABLE COST	\$ 1,193.71	\$ 1,765.19	\$ 1,480.36	\$ 4,335.69	\$ 1,788.92
CONTRIBUTION MARGIN	\$ 606.29	\$ 634.81	\$ 1,039.64	\$ 1,664.31	\$ 1,711.08

NEXT STEPS

Ultimately, the goals of this project had to be adjusted significantly as a direct result of the reality faced in this industry. Several general conclusions can be drawn about producers in Alberta's vegetable industry to help inform future benchmarking efforts. Some of those characteristics are outlined below:

1. Producers had not been sufficiently engaged in initial stages of the development of the cost of production development process. Some producers are doing very well, in part because they have control over a certain segment of the vegetable industry and do not want to see this equilibrium upset by encouraging new production that could potentially lower their prices.
2. Producers are somewhat reluctant to release information that might be transferred from one grower to another. There is a very competitive attitude among the producers who object to the release of any of their cost data.
3. Individual growers have to compete with extremely well organized production units from outside Alberta and yet apparently do not have the same access to other markets.
4. There is a need for greater understanding of the value of cost-based accounting in support of both production and investment decisions. Current cost data is not widely available as few producers keep records that would allow detailed production cost analysis. It became clear that government needs to be able to measure the costs of production, but it is extremely hard to do due to the fact that the growers are very diverse and costs are not comparable because of lack of consistency.

These realities and attitudes stem in part from recent history for some growers who have direct experience with failed attempts at cooperation in the industry. This has led to some distrust between some industry participants, including both growers and distributors. However, in the course of this study, a number of industry participants expressed a strong desire to get past these issues. Some are actively pursuing cooperation with others as a way to share information and pool resources. Some of these have resulted in very successful cooperative initiatives which may serve to change the nature of the industry attitudes over the coming years.

The next steps become relatively important for ARD in terms of engaging the commercial vegetable industry. There is a need to consider a longer term commitment to the process, including the time and effort required in order to identify clearly who is in the sector and determine how best to serve them.

At the present time, many in this sector do not appear to feel the need to engage with government or industry organizations, and until they feel that cost of production data is useful to support their decision making, it will be difficult to gain full participation. The concept of providing benchmark information is only of use if there are a critical number of producers interested in learning from other producer's information. In the case of commercial fruits and vegetables, there are so few producers that the information is of little attraction to them.

From a public policy perspective the findings suggest that perhaps ARD efforts may best be focused on a sector of the industry with more participants and/or new entrants. Ultimately this points towards the direct marketing sector. While not of the same production scale potential, there would appear to be more opportunity to engage with this group.

This would help focus the limited resources on those producers who are most interested in engaging with ARD, and ultimately this group could potentially provide a solid pool of production that may well lead to expansion of vegetable processing capacity if the opportunity were to arise. During our discussions it became abundantly clear that while costing information was of little interest to producers, public agronomic research would be of tremendous interest. As such it would be our opinion that any current engagement with the sector focus on that aspect of public policy.

We are also of the opinion that the work that was completed in this project and the COP information provided could be of use to some new entrants if they are looking to expand to Alberta. The information would have to be used with a significant amount of caution, since it is based on the input of only a few individuals whose business could be impacted if competitors could identify their specific cost profile.

In summary, the current stakeholders in the sector have come through a tough decade of industry consolidation and occasionally failed cooperation. This reality has had a significant impact on the willingness of growers to participate in developing industry wide benchmarks. Future engagement would be well advised to take these lessons in hand when designing industry support mechanisms.

APPENDIX A

DETAILED COST OF PRODUCTION BENCHMARKS

Appendix A.1: Cost of Production of Sweet Corn

	Unit	Cost (\$/unit)	Quantity	Cost (\$/acre)	Total Cost 10 acres
GROSS REVENUE	box	14.00	250.00	3,500.00	35,000.00
VARIABLE COSTS					
Seed				55.00	550.00
Phosphate	lb	0.78	60.00	46.80	468.00
Potassium	lb	0.35		-	-
Nitrogen	lb	0.70	100.00	70.00	700.00
Sulphur	lb	0.34	30.00	10.20	102.00
Zinc	lb	1.36		-	-
Boron	lb	2.82		-	-
Fertilizer Spreading				11.18	111.80
Insecticide				20.00	200.00
Herbicide				25.00	250.00
In-field cultivation				15.00	150.00
Fungicide				25.00	250.00
Soil Test				3.00	30.00
Crop/Hail Insurance				65.00	650.00
Custom Hauling	box	0.50	250.00	125.00	1,250.00
Cardboard	box	2.00	250.00	500.00	5,000.00
Labour	hour	11.00	20.00	220.00	2,200.00
Irrigation Water				16.00	160.00
Irrigation Power				45.00	450.00
Irrigation Repair				12.00	120.00
Electricity				200.00	2,000.00
Natural Gas				20.00	200.00
Machine Repairs				50.00	500.00
Fuel & Lube				60.00	600.00
Custom Aerial				24.00	240.00
Operating Interest				85.55	855.50
Overhead				85.19	851.86
TOTAL VARIABLE COST				1,788.92	17,889.16
FIXED COSTS					
Machinery Depreciation				320.00	3,200.00
Machinery Interest				100.00	1,000.00
Machinery Insurance				40.00	400.00
Building Depreciation				80.00	800.00
Building Interest				50.00	500.00
Building Insurance				20.00	200.00
MACHINE HOUSING				4.90	49.00
MANAGEMENT				500.00	5,000.00
LAND RENT				200.00	2,000.00
TOTAL FIXED COST				1,314.90	13,149.00
TOTAL COST				3,103.82	31,038.16
CONTRIBUTION MARGIN				1,711.08	17,110.84
NET RETURN				396.18	3,961.84

Appendix A.2: Cost of Production of Cucumbers

	Unit	Cost (\$/unit)	Quantity	Cost (\$/acre)	Total Cost 10 acres
GROSS REVENUE	box	10.00	600.00	6,000.00	60,000.00
VARIABLE COSTS					
Seed				17.00	170.00
Phosphate	lb	0.78	60.00	46.80	468.00
Potassium	lb	0.35		-	-
Nitrogen	lb	0.70	100.00	70.00	700.00
Sulphur	lb	0.34	30.00	10.20	102.00
Zinc	lb	1.36		-	-
Boron	lb	2.82		-	-
Fertilizer Spreading				11.18	111.80
Insecticide				20.00	200.00
Herbicide				35.00	350.00
In-field cultivation				15.00	150.00
Fungicide				25.00	250.00
Soil Test				3.00	30.00
Custom Hauling	box	0.50	600.00	300.00	3,000.00
Cardboard	box	2.00	600.00	1,200.00	12,000.00
Labour	hour	11.00	150.00	1,650.00	16,500.00
Irrigation Water				16.00	160.00
Irrigation Power				45.00	450.00
Irrigation Repair				12.00	120.00
Electricity				200.00	2,000.00
Natural Gas				20.00	200.00
Machine Repairs				65.00	650.00
Fuel & Lube				65.00	650.00
Custom Aerial				24.00	240.00
Crop/Hail Insurance				65.00	650.00
Operating Interest				214.05	2,140.50
Overhead				206.46	2,064.61
TOTAL VARIABLE COST				4,335.69	43,356.91
FIXED COSTS					
Machinery Depreciation				560.00	5,600.00
Machinery Interest				175.00	1,750.00
Machinery Insurance				70.00	700.00
Building Depreciation				80.00	800.00
Building Interest				50.00	500.00
Building Insurance				20.00	200.00
MACHINE HOUSING				4.90	49.00
MANAGEMENT				500.00	5,000.00
LAND RENT				200.00	2,000.00
TOTAL FIXED COST				1,659.90	16,599.00
TOTAL COST				5,995.59	59,955.91
CONTRIBUTION MARGIN				1,664.31	16,643.09
NET RETURN				4.41	44.09

Appendix A.3: Cost of Production of Fresh Potatoes

	Unit	Cost (\$/unit)	Quantity	Cost (\$/acre)	Total Cost 380 acres
GROSS REVENUE	tonne	150.00	16.00	2,400.00	912,000.00
VARIABLE COSTS					
Seed	cwt	9.00	28.00	252.00	95,760.00
Custom Hauling (Seed)	tonne	8.60	1.15	9.89	3,758.20
Seed Bactericide				65.00	24,700.00
Phosphate	lb	0.78	120.00	93.60	35,568.00
Potassium	lb	0.35	50.00	17.50	6,650.00
Nitrogen	lb	0.70	150.00	105.00	39,900.00
Sulphur	lb	0.34	30.00	10.20	3,876.00
Zinc	lb	1.36	5.00	6.80	2,584.00
Boron	lb	2.82	1.50	4.23	1,607.40
Custom Fertilizer				11.50	4,370.00
Insecticide				123.04	46,755.20
Herbicide				51.71	19,647.90
Fungicide				137.16	52,118.90
Consultant				35.00	13,300.00
Custom Hauling	tonne	11.00	16.80	184.80	70,224.00
Labour	hour	18.00	8.00	144.00	54,720.00
Irrigation Water				22.00	8,360.00
Irrigation Power				45.00	17,100.00
Irrigation Repair				12.00	4,560.00
Machine Repairs				140.00	53,200.00
Fuel & Lube				100.00	38,000.00
Custom Aerial				24.00	9,120.00
Operating Interest				86.71	32,951.13
Overhead				84.06	31,941.54
TOTAL VARIABLE COST				1,765.19	670,772.27
FIXED COSTS					
Machinery Depreciation				147.37	56,000.00
Machinery Interest				46.05	17,500.00
Machinery Insurance				18.42	7,000.00
Building Depreciation				84.21	32,000.00
Building Interest				52.63	20,000.00
Building Insurance				21.05	8,000.00
MACHINE HOUSING				4.90	1,862.00
MANAGEMENT				75.00	28,500.00
LAND RENT				300.00	114,000.00
TOTAL FIXED COST				749.64	284,862.00
TOTAL COST				2,514.83	955,634.27
CONTRIBUTION MARGIN				634.81	241,227.73
NET RETURN				- 114.83	- 43,634.27

Appendix A.4: Cost of Production of Carrots (Dryland)

	Unit	Cost (\$/unit)	Quantity	Cost (\$/acre)	Total Cost 125 acres
GROSS REVENUE	tonne	120.00	15.00	1,800.00	225,000.00
VARIABLE COSTS					
Seed				400.00	50,000.00
Phosphate	lb	0.78	50.00	39.00	4,875.00
Potassium	lb	0.35	50.00	17.50	2,187.50
Nitrogen	lb	0.70	100.00	70.00	8,750.00
Sulphur	lb	0.34	30.00	10.20	1,275.00
Zinc	lb	1.36	5.00	6.80	850.00
Boron	lb	2.82	1.50	4.23	528.75
Custom Fertilizer				11.50	1,437.50
Insecticide				15.00	1,875.00
Herbicide				35.00	4,375.00
Fungicide				20.00	2,500.00
Soil Test				3.00	375.00
Consultant				35.00	4,375.00
Custom Hauling	tonne	11.00	15.75	173.25	21,656.25
Labour	hour	12.00	8.07	96.84	12,105.00
Electricity				30.00	3,750.00
Natural Gas				20.00	2,500.00
Machine Repairs				50.00	6,250.00
Fuel & Lube				40.00	5,000.00
Operating Interest				59.55	7,443.75
Overhead				56.84	7,105.44
TOTAL VARIABLE COST				1,193.71	149,214.19
FIXED COSTS					
Machinery Depreciation				192.00	24,000.00
Machinery Interest				60.00	7,500.00
Machinery Insurance				24.00	3,000.00
Building Depreciation				24.00	3,000.00
Building Interest				15.00	1,875.00
Building Insurance				750.00	93,750.00
Machine Housing				6.00	750.00
Management				150.00	18,750.00
Land Rent				100.00	12,500.00
TOTAL FIXED COST				1,321.00	165,125.00
TOTAL COST				2,514.71	314,339.19
CONTRIBUTION MARGIN				606.29	75,785.81
NET RETURN				- 714.71	- 89,339.19

Appendix A.5: Cost of Production of Carrots (Irrigated)

	Unit	Cost (\$/unit)	Quantity	Cost (\$/acre)	Total Cost 125 acres
GROSS REVENUE	tonne	120.00	21.00	2,520.00	315,000.00
VARIABLE COSTS					
Seed				400.00	50,000.00
Phosphate	lb	0.78	120.00	93.60	11,700.00
Potassium	lb	0.35	50.00	17.50	2,187.50
Nitrogen	lb	0.70	150.00	105.00	13,125.00
Sulphur	lb	0.34	30.00	10.20	1,275.00
Zinc	lb	1.36	5.00	6.80	850.00
Boron	lb	2.82	1.50	4.23	528.75
Custom Fertilizer				11.50	1,437.50
Insecticide				15.00	1,875.00
Herbicide				35.00	4,375.00
Fungicide				20.00	2,500.00
Soil Test				3.00	375.00
Consultant				35.00	4,375.00
Custom Hauling	tonne	11.00	22.05	242.55	30,318.75
Labour	hour	12.00	8.07	96.84	12,105.00
Irrigation Water				22.00	2,750.00
Irrigation Power				45.00	5,625.00
Irrigation Repair				12.00	1,500.00
Electricity				30.00	3,750.00
Natural Gas				20.00	2,500.00
Machine Repairs				50.00	6,250.00
Fuel & Lube				40.00	5,000.00
Custom Aerial				24.00	3,000.00
Operating Interest				70.65	8,831.25
Overhead				70.49	8,811.69
TOTAL VARIABLE COST				1,480.36	185,045.44
FIXED COSTS					
Machinery Depreciation				192.00	24,000.00
Machinery Interest				60.00	7,500.00
Machinery Insurance				24.00	3,000.00
Building Depreciation				24.00	3,000.00
Building Interest				15.00	1,875.00
Building Insurance				6.00	750.00
MACHINE HOUSING				4.90	612.50
MANAGEMENT				150.00	18,750.00
LAND RENT				250.00	31,250.00
TOTAL FIXED COST				725.90	90,737.50
TOTAL COST				2,206.26	275,782.94
CONTRIBUTION MARGIN				1,039.64	129,954.56
NET RETURN				313.74	39,217.06

APPENDIX B: COST OF PRODUCTION PRIMARY DATA COLLECTION SHEET

General Information

Name

Location

Phone #

Description of Farm

Crops Grown

Crop

% of Farm Income

Irrigation Description		

Financial or Cost Record Keeping

By farm

By crop

By field

Field Operations 2011

Name

Crop Type

Field Preparation **Description** **Notes**

Operation 1

Operation 2

Operation 3

Operation 4

Fertilizer **Description** **Notes**

Pre plant fertilizer

Additional fertilizer

Fertilizer application

Seed and Seeding **Description** **Notes**

Seed

Seed Treatment

Seeding



Herbicides	Description	Notes
Herbicide 1		
Herbicide 2		
Herbicide 3		
Herbicide 4		
Herbicide 5		

Other in crop work (roguing, hilling)	Description	Notes

Harvest	Description	Notes

Post Harvest Field Operations	Description	Notes

Processing (washing, packaging)	Description	Notes



2011 Cost of Production

Name _____

Crop Type _____

Acres _____

Reported on (field, total farm,
per acre) _____

Actual or Estimate (?) _____

	2011	2010	2009	2008	2007
Yield					
Estimate wastage (if not included in yield)					
Average selling price					

Expenses	Costs	Adjustment to normalize if required	Notes
Amortization of costs from other years/crops			
Seed/ plants			
Fertilizer			
Chemical			
Fuel			
Labour			
Direct			
Management			
Administration			
Other			
Expenses	Costs	Adjustment to normalize if required	Notes



Sampling, quality control			
Tools			
Production Supplies			
Marketing costs			
Co-op charges			
Packaging			
Transportation			
Other			
Water			
Power			
Heat			
Other utilities			
Repairs and Maintenance			
Professional fees			
Taxes			
Insurance			
Bank charges and interest (not on long term or operating loans)			
Telephone, internet, fax			
Computer (Software, maintenance)			
Office supplies, postage			
Interest on Operating or Capital Loans/ Leases			
Depreciation			
Expenses	Costs	Adjustment to normalize if required	Notes
Other			



Other			
Other			
Total			

Capital	Description	Year	Year Purchased	Purchase Price	Estimate of Year's Remaining	Allocation per year for this Crop Relative to Other Crops
Buildings						
Generators						
Storage equipment (coolers, air flow systems)						
Water systems						
Storage containers, boxes						
Vehicles						
Tractors						
Field Equipment						
Processing Equipment						



Capital	Description	Year	Year Purchased	Purchase Price	Estimate of Year's Remaining	Allocation per year for this Crop Relative to Other Crops
Storage Equipment						
Other Equipment						
Land						
Irrigation Equipment						
Land Improvements (fences...)						
Administration/ Office Equipment						
Other (land maintenance, pressure washers...)						
Greenhouse if growing transplants						



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Alberta Producer and Marketing Organizations

Alberta Farmers' Market Association
PO Box 69071
13040-137 Avenue
Edmonton, AB T5L 5E3
Phone: 1-866-754-AFMA (2362)
www.albertamarkets.com

Alberta Farm Fresh Producers Association
Box 20, Site 3, RR 1
Okotoks, AB T1S 1A1
Phone: 1-800-661-2642
www.albertafarmfresh.com/vegetable.htm

Alberta Greenhouse Growers Association
200, 10331-178 St.
Edmonton, AB T5S 1R1
Phone: 1-800-378-3198
www.agga.ca

Alberta Vegetable Growers (Processing) Board
Phone: 403 223-4242
Fax: 403 223-3130
avgp@telusplanet.net
no website

Potato Growers of Alberta
6008-46 Avenue
Taber, Alberta T1G 2B1
Phone: (403) 223-2262
www.albertapotatoes.ca/contactus.aspx

National Organizations

Canadian Horticultural Council www.hortcouncil.ca

Canadian Produce Marketing Association www.cpma.ca

Calgary Branch of CPMA: Calgary Produce Marketing Association www.calgarypma.ca

Fresh Produce Alliance www.freshproducealliance.com

North American Strawberry Growers Association www.nasga.org