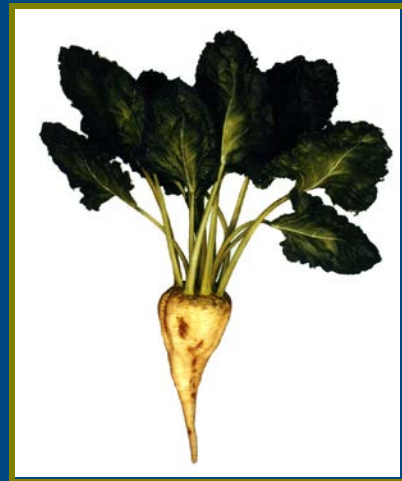


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The Economics of Sugar Beet Production in Alberta 2012



**THE ECONOMICS OF
SUGAR BEET PRODUCTION**

IN ALBERTA

2012

by

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Economics Branch

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SECTION I

INTRODUCTION

Sugar beet is a biennial plant that grows best in rich, deep soil and temperate climate. Sugar beet production is well suited for the irrigated land in southern Alberta. Sugar beets are a rotation crop, planted once every four years to minimize potential disease problems. It is land and labour intensive and is grown with supplementary irrigation. Seeding begins in early spring and continues to the end of May. Harvesting usually starts in September and is completed by November depending on the start date. Currently, all sugar beets are grown only under contract with Lantic Inc., which operates the processing plant located in Taber, Alberta.

Alberta Agriculture and Rural Development (ARD) have been monitoring the costs and returns of livestock and crop production in the province in an extensive way since the 1960s. These studies have been viewed as an important tool for assisting producers in their cropping decisions as well as for developing policies and programs for the different farm enterprises in the province and Canada. Where information gaps existed in other provinces, results from these studies have served as the basis to fill those gaps.

Sugar beet production costs and returns in Alberta have been monitored since the early 1970s. The 2012 cost and return study is a continuing effort to monitor changes in the sugar beet industry in the province. This year's information, like previous years, would be used for several purposes including policy and program development for the sugar beet industry. Results of the cost of production studies have been helpful in contract negotiations between the Sugar Beet Board and the sugar factory executives in Taber. It has also been helpful to growers in managing their farms.

Objectives

Major objectives of the study are:

- i. To develop production costs and returns for sugar beet production in Alberta.
- ii. To assist sugar beet growers with farm budgeting and planning.
- iii. To analyze economies of scale; machine use and input/output relationships for sugar beet production.

- iv. To provide each study participant with an individual farm analysis along with group averages.
- v. To provide an annual update for policy and program development and for extension personnel.

Study Sample

The sample for the 2012 study was originally selected from a list of producers who held sugar beet contracts. The random selection of the sample ensured a representative cross section of producers in the province. In total, detailed cost and return information on twenty four (24) sugar beet fields (owned and rented) were collected and analyzed. Each of these fields was recorded separately. These 24 fields represented about eight percent of the total area of sugar beets harvested in 2012.

SECTION II

METHOD OF ANALYSIS

The raw data obtained from the twenty four (24) fields were reviewed for any information gaps before entering into the computer for analysis. In the past years, a mainframe computer program was used to analyze both the individual farm reports as well as computing group averages. For the last several crop years, Paradox 9 Program (micro computer database) has been used to analyze the data. This program allows changes and updates in many of the cost allocations.

Fuel, Repairs and Machine Investment Allocations

Farm records are usually kept on a whole farm basis. Many input costs are separable by enterprise type since crop management requires it (fertilizer and chemical use for example). Records on other important costs such as fuel and repairs are not usually kept on an enterprise level, hence, it becomes difficult sometime to come up with exact or actual numbers for such costs. Therefore, the participating producers were asked for feedback to see if cost allocations have been reasonable for their operations and most specifically the enterprise being analyzed. The cost of production studies undertaken by the Economics Branch of ARD have attempted to allocate costs on a crop-by-crop basis where farm records alone were insufficient or difficult to separate such costs. Sugar beet production requires intensive use of fertilizer, chemicals, fuel, labour and equipment. Proper allocation of these factors of production is important if results are to be used with confidence.

Machine investment was allocated by the study participants (beet producers) with the surveyor. Specialized sugar beet equipment was allocated 100 percent to the sugar beet enterprise. Other machinery, which was used on both conventional crops as well as sugar beet land, was allocated based on relative use. An engineering model was developed to study the time spent with various machines on a per acre basis¹. These results were used to

¹ Prior to 1990, repair costs to sugar beet equipment were allocated 100 percent to the sugar beet enterprise and repair costs to all other machinery were allocated based on machine investment. However for 2007, repair costs were allocated according to machine use, which was based on an engineering model.

allocate machine investment between various enterprises on the farm (i.e., grain vs. sugar beet production).

Fuel use is another factor of production, which was allocated within the computer program since most producers do not keep separate records on a field-by-field basis. Results from the engineering model indicated that sugar beet production on average uses approximately 2.9 times the amount of fuel as compared to a conventional grain crop grown on irrigation².

Preliminary analyses results were sent to the survey participants for their review and comments, if any. Also any numbers which appeared to be out of range were identified and producers were asked to verify those. Before developing the provincial and group averages, sugar beet producers were extensively consulted at all stages of data collection and analysis.

² Results of the model also showed that fuel use on conventional crop production under irrigation uses 1.7 times the amount of fuel used for dryland crop production. Earlier studies allocated fuel costs based only on machine investment by enterprise.

SECTION III

KEY STATISTICS ON SUGAR BEET PRODUCTION IN ALBERTA, 1980-2013

Table 1 shows a historical data on sugar beet production in Alberta from 1980 to 2013. The data reported include acres contracted, acres planted and harvested, tonnage harvested, yield per acre and price per tonne received by beet producers. Figures 1 to 5 present trends for beet production from 1980 to 2013 on acres contracted, acres planted, acres harvested, tonnage harvested and yield per acre. Figure 6 shows trends in beet prices from 1980 to 2012. The final price for the 2013 sugar beet crop will be available sometime in October/November 2014.

During the last thirty-three (33) years, contracted area under sugar beets in Alberta has fluctuated considerably, ranging from a low of about 18,400 acres in 2008 to almost 46,000 acres in 1999. As shown in Table 1 or Figure 1, there were no sugar beets grown in 1985 as a result of contractual difficulties. Over 40,000 acres were contracted annually from 1998 to 2000. The acres contracted in 1998 were approximately 25 percent higher compared to 1997 due to the expansion of the sugar factory. In 1999, area contracted for sugar beet production increased by about 10 percent to 45,965 acres. In 2000, contracted area for sugar beets decreased by about seven percent as several growers took leave from producing beets.

In 2001, contracted area for sugar beets decreased drastically by 29 percent (from 42,864 acres in 2000 to 30,501 acres in 2001). This was because like the previous year, a large number of beet producers took leave from producing beets due to anticipated water shortage and price concerns. Beet acreage contracted in 2002 further decreased marginally as some beet producers opted to grow other crops. In 2003, the area contracted for beet production decreased by about four percent to 28,800 acres, the lowest since 1980.

As shown in Table 1 or Figure 1, over 34,000 acres were contracted annually from 2004 to 2007. In 2006, sugar beet growers produced a record crop. Tonnage production in 2007 was also very high. As a result, the sugar factory negotiated to decrease area contracted by over 46 percent in 2008. Contracted acres increased from 2009 to 2011 after which it started to decrease (Table 1 or Figure 1).

In 2013, 24,948 acres were contracted for beet production. This represent a decrease of about 18 percent compared to the 2012 area of 30,528 acres. Over the past thirteen years (2000-2013), average area contracted has decreased by approximately 42 percent.

Sugar beet tonnage harvested over the period 1980 to 2013, ranged from a low of 385,219 tonnes in 2008 to 963,165 tonnes in 2006. The yearly fluctuation in tonnage harvested is due to the fluctuation in harvested acres and yield. The dramatic increase in sugar beet production in 2006 was due to a high yield of about 26 tonnes, almost five to six tonnes per acre more beets compared to previous years. The 2008 beet production was the smallest crop ever due to lower contracted and harvested acres, and lower yield. Area under beets in 2008 was almost half of area used for producing beets in an average year. In 2013, about 668,087 tonnes were harvested, a decrease of 19 percent compared with the 2012 production of about 827,434 tonnes. As illustrated by Figure 4, harvested tonnage of sugar beet in Alberta generally trended upward from 1980 to 2013.

Yield per acre has also shown considerable variation over the period 1980 to 2013, ranging from 15.22 tonnes per acre in 2002 to about 27.69 tonnes per acre in 2013. The low yield per acre in 2002 could be attributed to weather resulting in overall poor production conditions both during growing and harvest seasons. As shown in Table 1 or Figure 5, average yield per acre in 2013 was 27.69 tonnes. Over the past thirteen years (2000-2013), average yield per acre has increased by approximately 26 percent. As illustrated by Figure 5, yield per acre has trended positively over the past thirty-three years.

Beet prices have also fluctuated quite dramatically during the last 32 years, i.e., from 1980 to 2012. Prices have ranged from about \$31 per tonne in 1984 to \$67 per tonne in 1980, approximately 116 percent difference³. As shown in Table 1 or Figure 6, the final price received by beet growers in 2012 was \$55.10 per tonne, an increase of about three percent compared to 2011 price. This translates to payments of over \$45 million to sugar beet growers given the 2012 provincial harvested beets of 827,434 tonnes.

³ All prices reported are in nominal dollars. In other words, these were the actual prices received by the producers.

Table 1: Historical Data on Sugar Beet Production in Alberta, 1980-2013

Year	Acres Contracted	Acres Planted	Acres Harvested	Tonnage Harvested	Yield per Acre (Tonnes)	Price per Tonne (\$)
1980	35,609	34,850	33,771	524,251	15.52	66.99
1981	35,405	35,139	35,071	715,082	20.39	47.87*
1982	32,161	31,833	30,502	474,866	15.57	55.59*
1983	32,354	31,883	31,563	569,846	18.05	38.76
1984	32,075	31,559	28,830	513,180	17.80	31.49
1985	- - - no sugar beet production - - -					
1986	30,054	29,711	28,493	596,122	22.92	39.25*
1987	29,983	29,438	29,169	564,814	19.36	45.26*
1988	29,575	28,945	28,109	540,405	19.22	41.16*
1989	30,619	29,632	29,483	499,061	16.93	45.19
1990	33,299	32,875	32,664	590,303	18.07	42.28*
1991	33,260	33,013	32,779	634,949	19.37	34.38*
1992	32,148	31,351	31,127	475,823	15.29	38.19
1993	33,088	32,504	32,432	542,253	16.72	41.99*
1994	35,399	34,944	34,836	737,774	21.25	43.16*
1995	34,506	33,913	33,656	688,498	20.46	43.70
1996	34,043	33,784	33,463	676,611	20.22	42.13
1997	33,467	33,326	33,124	650,423	19.64	48.30
1998	41,742	41,250	41,132	959,310	23.32	33.82
1999	45,965	44,731	44,522	839,773	18.86	35.30
2000	42,864	42,422	42,017	920,252	21.90	32.30
2001	30,501	30,236	28,457	523,110	18.38	46.20
2002	30,089	29,670	27,754	422,389	15.22	36.74
2003	28,807	27,831	27,389	628,081	22.93	42.62
2004	35,384	35,113	34,954	740,508	21.19	45.02
2005	34,302	34,595	33,667	668,141	19.85	45.02
2006	37,204	37,537	36,992	963,165	26.04	40.58
2007	34,138	34,302	34,067	853,669	25.06	43.24
2008	18,397	18,270	18,211	385,219	21.15	45.73
2009	29,653	29,995	23,128	526,686	22.77	44.05
2010	30,379	31,109	30,360	573,640	18.90	53.12
2011	33,598	33,672	33,307	784,500	23.55	53.52
2012	30,528	30,527	30,306	827,434	27.30	55.10
2013	24,948	24,425	24,127	668,087	27.69	N/A

Source: Alberta Sugar Beet Growers. Taber, Alberta.

(*) Price includes payments under the Stabilization and Tripartite Programs. N/A=Not available.

Figure 1: Sugar Beet Acres Contracted in Alberta, 1980-2013

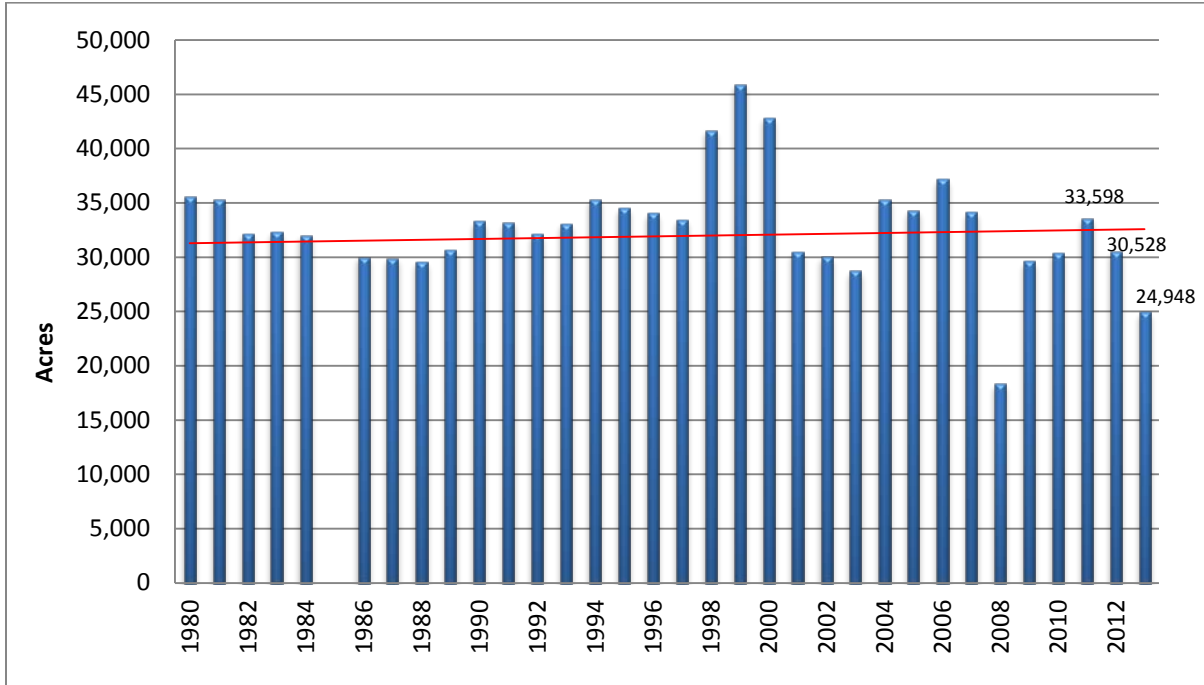


Figure 2: Sugar Beet Acres Planted in Alberta, 1980-2013

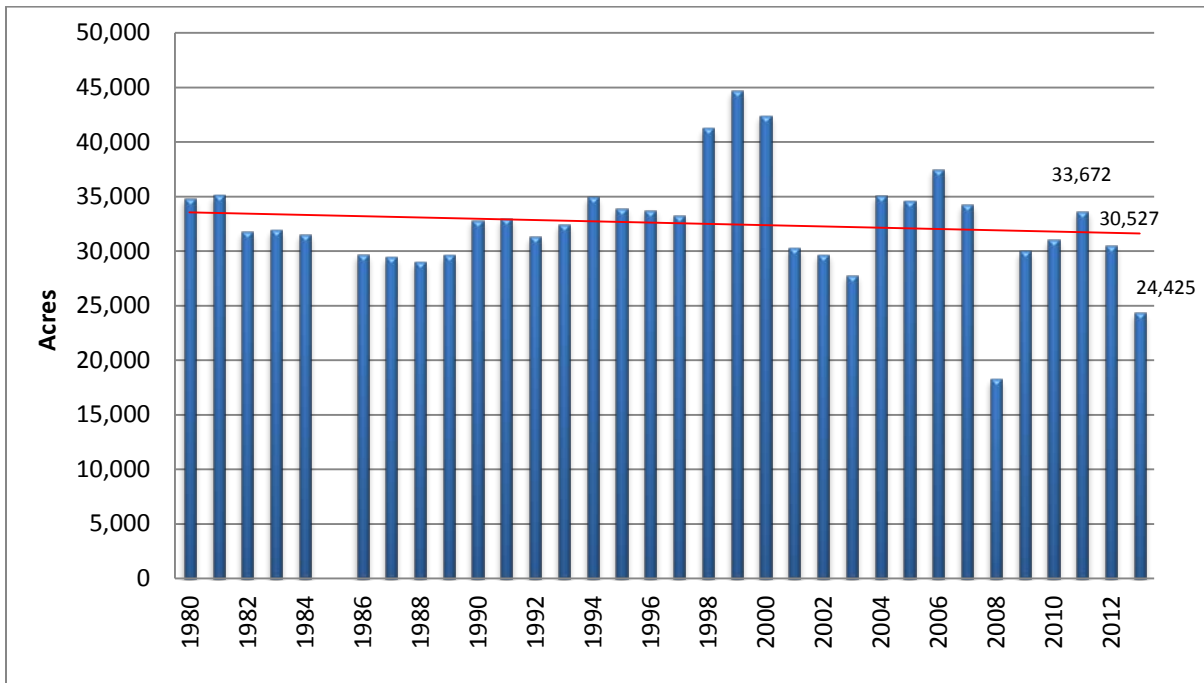


Figure 3: Sugar Beet Acres Harvested in Alberta, 1980-2013

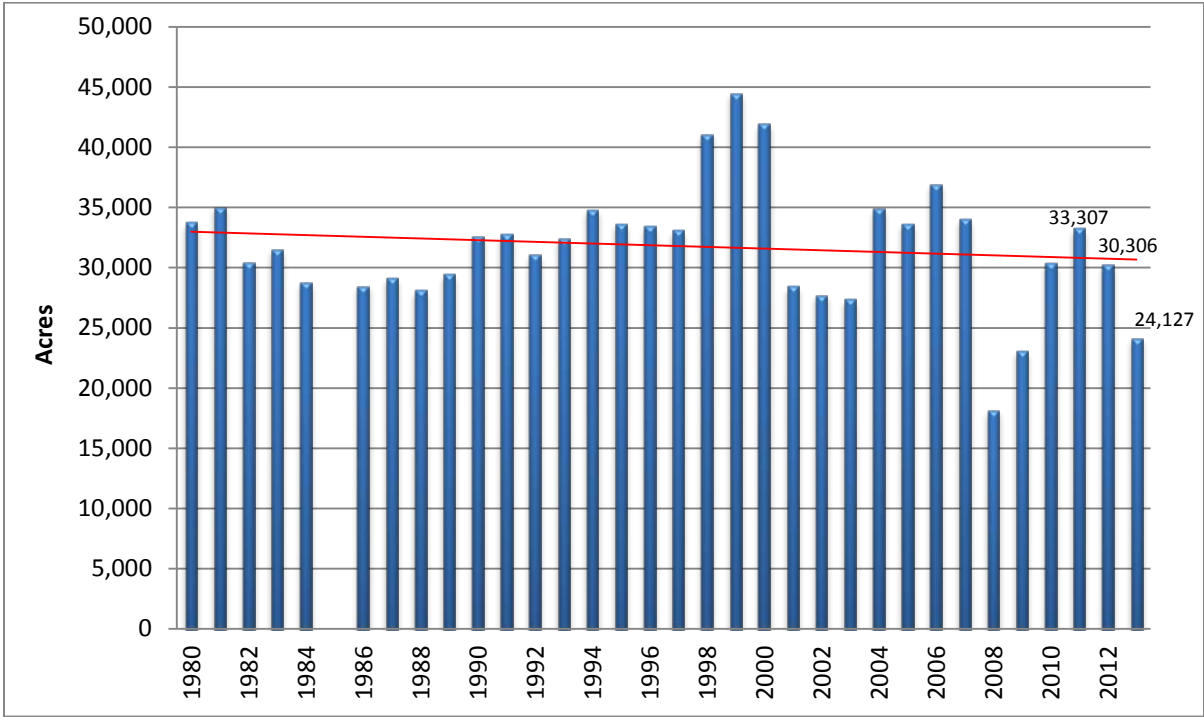


Figure 4: Sugar Beet Tonnage Harvested in Alberta, 1980-2013

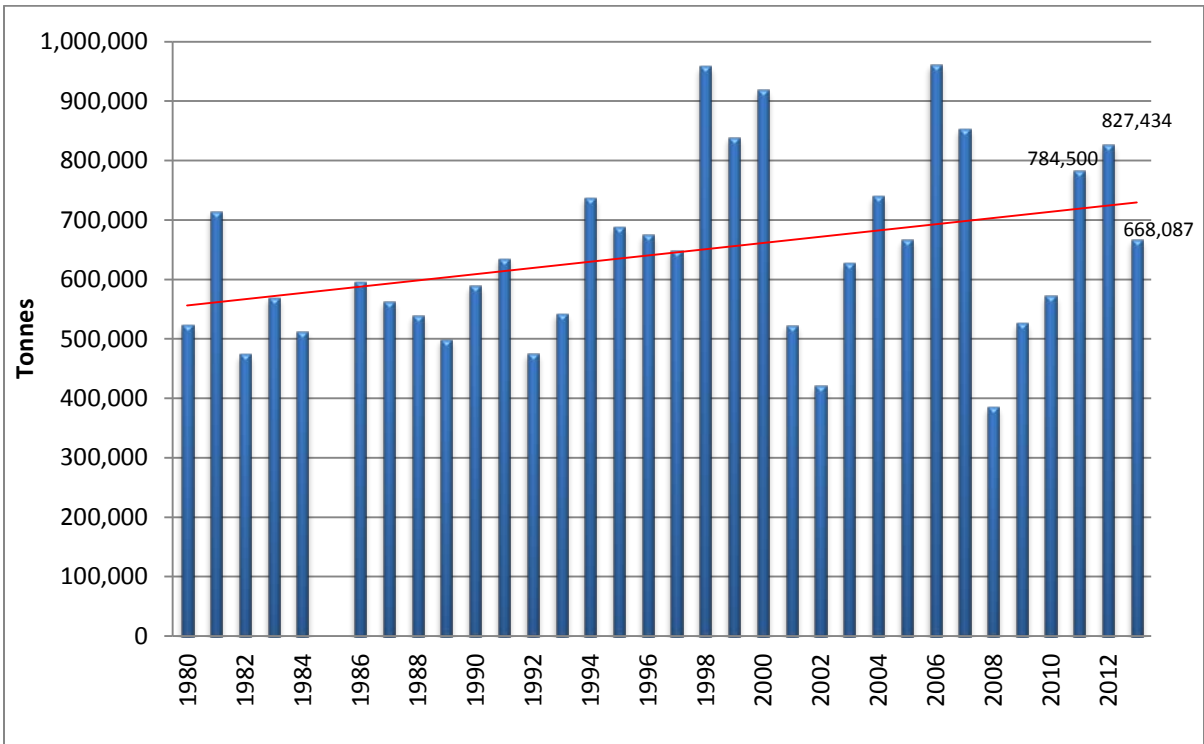


Figure 5: Sugar Beet Yield per Acre in Alberta (Tonnes), 1980-2013

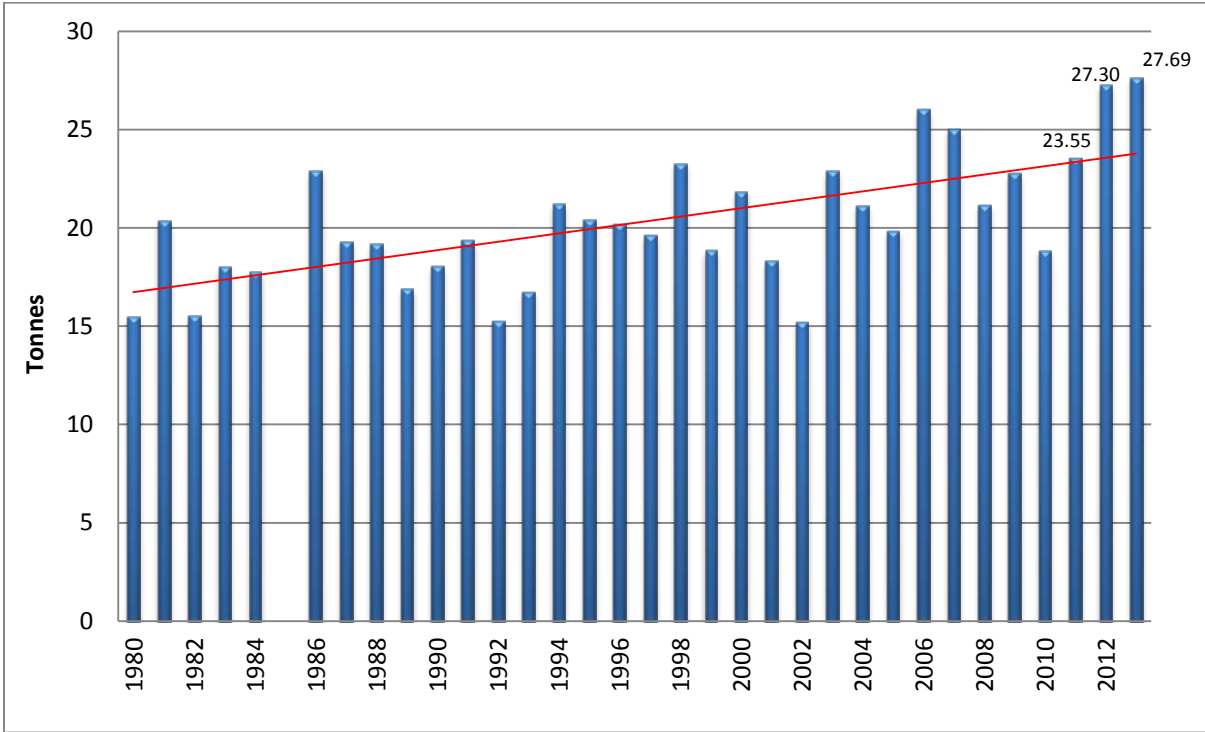
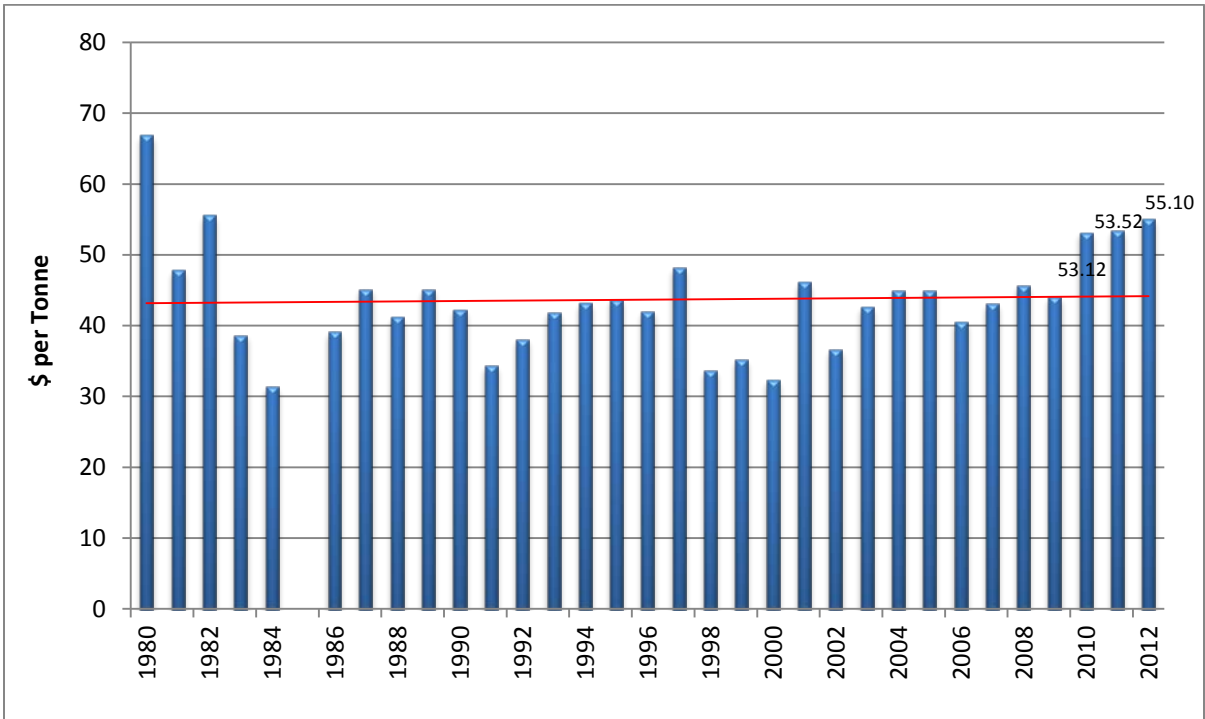


Figure 6: Sugar Beet Price per Tonne in Alberta, 1980-2012



SECTION IV

SUGAR BEET PRODUCTION COSTS AND RETURNS, 2012

The 2012 sugar beet study sample comprise of costs and returns data on twenty four (24) sugar beet fields. These 24 fields represent about eight percent of the total area of sugar beets harvested in 2012. The study sample was considered adequate to develop costs and returns data for the 2012 beet crop. It was divided into two groups to develop production costs and returns for beets grown on owned land (10 fields) and beets grown on rented land (14 fields).

Gross Returns

Table 2 presents production costs and returns for the entire study sample (24 fields). The costs and returns for beets produced on owned and rented lands are presented in Tables 3 and 4 respectively. As shown in Table 2, the average area cropped by each participant in the study sample was approximately 106 acres and these producers reported an average yield of 28.33 tonnes per acre. This average yield of 28.33 tonnes was higher by 0.64 tonnes compared to the provincial average of 27.69 tonnes in 2012. With a final price for the 2012 beet crop of \$55.10 per tonne, average value of production was estimated at \$1,561 per acre.

When miscellaneous receipts (crop insurance, rebates, patronage, custom work and other government program payments) were included, average gross revenue per acre for the study sample increased to \$1,589 per acre or \$56.09 per tonne. A detailed breakdown of the gross returns for the study sample, owned land and rented land are presented in Section A of Tables 2, 3 and 4 respectively.

Variable Costs

Detailed breakdown of various input costs are presented in Table 2. All of the costs are weighted averages and expressed on per acre and per tonne basis. Seed, fertilizer and chemicals amounted to \$265 per acre or approximately \$9.36 per tonne. In 2012, seed costs for beet production increased by nine percent compared to 2011. The entire crop in 2012 was planted to Roundup Ready sugar beets (GMO seed).

Average trucking/marketing costs, fuel, repair (machinery and buildings) and utilities costs for the entire study sample was estimated at approximately \$359 per acre or \$12.69 per tonne

(Table 2). These costs were estimated at about \$357 per acre or \$13.45 per tonne for beets produced on owned land (Table 3) and about \$360 per acre or \$12.38 per tonne for beets produced on rented land (Table 4).

Other most significant cost items for the 2012 sugar beet crop were paid and unpaid labour, custom work and specialized labour, and hail/crop insurance, which amounted to approximately \$100 per acre (\$3.55 per tonne). Together these costs accounted for about 13 percent of total variable costs. Unpaid family and operator labour amounted to about \$20 per acre (\$0.70 per tonne).

Total variable costs for the study sample amounted to \$749 per acre (\$26 per tonne). Total variable costs for sugar beets grown on owned and rented land (Tables 3 and 4) were \$788 per acre (\$29.65 per tonne) and \$731 per acre (\$25.11 per tonne) respectively. Figure 7 shows a graphical presentation of variable costs on a per acre basis for the study sample, beets grown on owned land and beets grown on rented land.

Total Cash Costs

Total cash costs refers to the sum of total variable and total capital costs less expenses associated with unpaid family and management labour and equipment and building depreciation. It represents all out-of-pocket costs incurred during the production period. As shown in Table 2, total cash costs for the study sample amounted to \$921 per acre or \$32.50 per tonne. Total cash costs for sugar beets grown on owned land (Tables 3) were \$846 (\$31.84 per tonne) compared with \$954 per acre (\$32.77 per tonne) for beets produced on rented land.

Capital Costs

Capital costs are "fixed" overhead costs, which are incurred regardless of the size of enterprise or the output on a per acre basis of the enterprise. These are cash (cash rent, crop share, taxes, water rates, insurance, paid capital interest) and non-cash capital costs (depreciation and lease payments). Total capital costs for the study sample amounted to \$292 per acre (\$10.30 per tonne). This represents about 28 percent of total sugar beet production costs in 2012. Capital costs were \$204 per acre (7.67 per tonne), approximately 21 percent of total costs of sugar beets produced on owned land (Table 3). Total capital costs for beets

produced on rented land amounted to \$331 per acre (11.38 per tonne) or approximately 31 percent of total production costs (Table 4).

Rental agreements generally include land rental, irrigation equipment and the sugar beet contract. Some producers rent land and irrigation equipment only. Average rental rate (a combination of the rental arrangements described above) for the 2012 crop was \$214 per acre (\$7.36 per tonne) for the fourteen (14) fields used to grow sugar beets on rented land (Table 4). Land rent represents approximately 20 percent of total production costs for these producers.

Taxes, water rates and insurance for the study participants were estimated at about \$19 per acre or about \$0.67 per tonne. These were about \$50 per acre (\$1.89 per tonne) for beets grown on owned land and \$5 per acre (\$0.17 per tonne) for beets grown on rented land.

Equipment and building depreciation was calculated for specialized sugar beet equipment while other equipment was allocated and pro-rated based on use between sugar beets and the remaining farm enterprises. Equipment depreciation was calculated based on the current value of machinery. These costs (equipment and building depreciation) were significant for a sugar beet enterprise, amounting to about \$100 per acre (\$3.53 per tonne) for the study sample. For beets produced on owned land, depreciation costs as shown in Table 3 were \$115 per acre (\$4.32 per tonne) compared to about \$93 per acre (\$3.21 per tonne) for beets produced on rented land (Table 4).

Total Production Costs

Total production costs for sugar beet production for the study sample of 24 fields were estimated at \$1,040 per acre or \$36.73 per tonne (Table 2). Of this, 88 percent were direct cash costs, almost 10 percent depreciation costs and the remaining two percent for unpaid operator labour. Figure 8 shows a graphical presentation of total production costs for the 2012 sugar beet study sample on a per acre basis. Total production costs for sugar beets grown on owned land (Tables 3) was estimated at \$992 or \$37.32 per tonne compared with \$1,062 per acre (\$36.49 per tonne) for beets produced on rented land.

Net Returns (Gross Margin, Returns to Unpaid Labour, Investment, and Equity)

Section (F) of Tables 2, 3 and 4 presents gross margin, returns to unpaid labour, investment, and equity for the study sample as well as beets grown on owned and rented land, respectively. The following procedures were used to calculate net returns:

Gross Margin

Gross margin is the difference between gross returns less total cash costs. Average gross margin was \$668 per acre or \$23.59 per tonne for the entire study sample (Table 2). It was \$693 per acre (\$26.08 per tonne) for beet produced on owned land (Table 3) and \$657 per acre (\$22.57 per tonne) for beet produced on rented land (Table 4).

Return to Unpaid Labour

Return to unpaid labour is gross returns less total production costs other than costs imputed for unpaid family and operator labour. Return to unpaid labour for the study sample was positive at \$568 per acre or \$20.06 per tonne. Return to unpaid labour for beets grown on owned land was positive at \$578 per acre or \$21.76 per tonne (Table 3). Return to unpaid labour for beets grown on rented was also positive at \$564 per acre or \$19.36 per tonne (Table 4).

Return to Investment

Return to investment reflects the dollar or percent return to the total value of assets. This represents gross return less total production costs with the exception of interest payments on capital spending. Return to investment for sugar beet production for the study sample was positive at \$573 per acre or \$20.23 per tonne (Table 2). It was positive at \$586 per acre (\$22.06 per tonne) for beets produced on owned land (Table 3). Return to investment was also positive at \$567 per acre (\$19.49 per tonne) for beets produced on rented land (Table 4).

Return to Equity

Return to equity is gross returns less total production costs (including all capital costs). The amount of money left to pay for unpaid family labour and management was positive at \$548 per acre or \$19.36 per tonne for the study sample (24 fields, Table 2). It was positive at \$547 per acre (\$20.60 per tonne) for beets produced on owned land (10 fields, Table 3). Return to equity was also positive at \$549 per acre or \$18.86 per tonne for beets produced on rented land (14 fields, Table 4).

Table 2: Sugar Beet Production Costs and Returns, 2012 (24 Enterprises)

Acres Cropped (acres)	106.46	
Yield Per Acre (tonne)	28.33	
	\$ per acre	\$ per tonne
GROSS RETURNS		
Crop Sales	1,560.96	55.10
Crop Insurance Receipts	20.79	
Miscellaneous Receipts	7.22	
A. TOTAL GROSS RETURN	1,588.97	56.09
VARIABLE COSTS		
Seed	141.90	
Fertilizer	110.61	
Chemicals	12.56	
Hail / Crop Insurance	17.63	
Association Fees and Research Levies	20.38	
Trucking and Marketing	138.83	
Machine Fuel (Net of Rebate)	69.29	
Irrigation Fuel	41.35	
Repairs - Machinery	67.74	
Repairs - Buildings	7.68	
Utilities, Insurance and Overhead	34.56	
Custom Work and Specialized Labour	23.78	
Operating Interest Paid	3.19	
Paid Labour and Benefits	39.30	
Unpaid Family and Operator Labour	19.77	
B. TOTAL VARIABLE COSTS	748.57	26.42
CAPITAL COSTS		
Cash Rent /Crop Share	148.22	
Taxes, Water Rates, Insurance	18.97	
Equipment/Building Depreciation	99.98	
Lease Payments	0.00	
Paid Capital Interest	24.75	
C. TOTAL CAPITAL COSTS	291.92	10.30
D. TOTAL CASH COSTS (B+C - Unpaid Labour - Depreciation)	920.74	32.50
E. TOTAL PRODUCTION COSTS (B+C)	1,040.49	36.73
F. NET RETURNS		
Gross Margin (A-D)	668.23	23.59
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	568.25	20.06
Return to Investment (A-E + Paid Capital Interest)	573.23	20.23
Return to Equity (A-E)	548.48	19.36
INVESTMENT		
Land and Buildings	2,170.04	
Machinery	828.69	

Source: Economics Branch, Alberta Agriculture and Rural Development, Edmonton, Alberta.

Table 3: Sugar Beet Production Costs and Returns (Owned Land), 2012 (10 Enterprises)

Acres Cropped (acres)	78.8	
Yield Per Acre (tonne)	26.58	
	\$ per acre	\$ per tonne
GROSS RETURNS		
Crop Sales	1,464.37	55.10
Crop Insurance Receipts	67.42	
Miscellaneous Receipts	7.62	
A. TOTAL GROSS RETURN	1,539.41	57.92
VARIABLE COSTS		
Seed	141.90	
Fertilizer	116.16	
Chemicals	14.14	
Hail / Crop Insurance	26.54	
Association Fees and Research Levies	20.05	
Trucking and Marketing	120.21	
Machine Fuel (Net of Rebate)	72.97	
Irrigation Fuel	59.43	
Repairs - Machinery	62.66	
Repairs - Buildings	6.33	
Utilities, Insurance and Overhead	35.87	
Custom Work and Specialized Labour	45.94	
Operating Interest Paid	3.41	
Paid Labour and Benefits	31.48	
Unpaid Family and Operator Labour	31.01	
B. TOTAL VARIABLE COSTS	788.10	29.65
CAPITAL COSTS		
Cash Rent /Crop Share	0.00	
Taxes, Water Rates, Insurance	50.32	
Equipment/Building Depreciation	114.73	
Lease Payments	0.00	
Paid Capital Interest	38.80	
C. TOTAL CAPITAL COSTS	203.85	7.67
D. TOTAL CASH COSTS (B+C - Unpaid Labour - Depreciation)	846.21	31.84
E. TOTAL PRODUCTION COSTS (B+C)	991.95	37.32
F. NET RETURNS		
Gross Margin (A-D)	693.20	26.08
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	578.47	21.76
Return to Investment (A-E + Paid Capital Interest)	586.26	22.06
Return to Equity (A-E)	547.46	20.60
INVESTMENT		
Land and Buildings	5,587.50	
Machinery	1171.03	

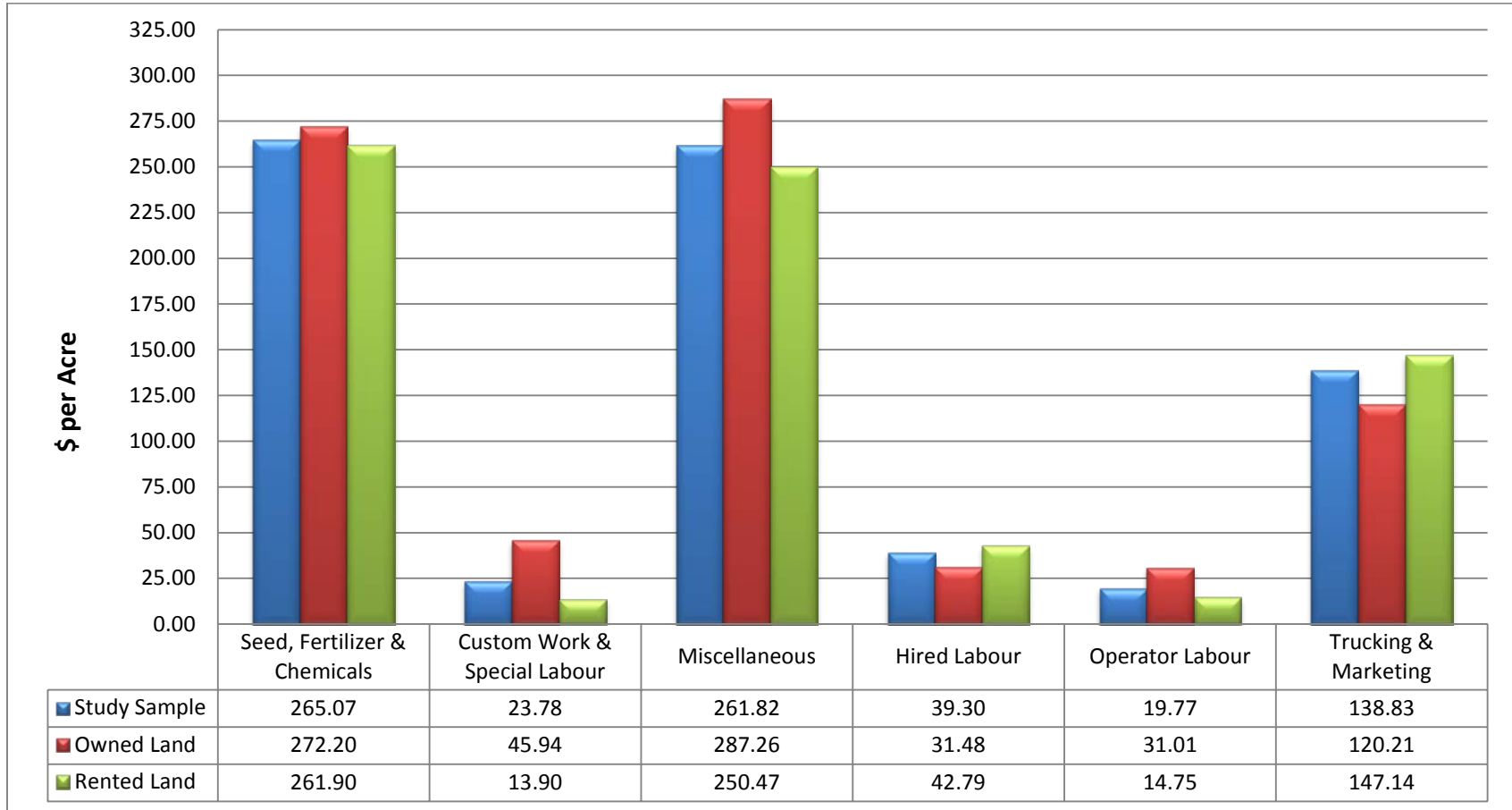
Source: Economics Branch, Alberta Agriculture and Rural Development, Edmonton, Alberta.

Table 4: Sugar Beet Production Costs and Returns (Rented Land), 2012 (14 Enterprises)

Acres Cropped (acres)	126.21	
Yield Per Acre (tonne)	29.11	
	\$ per acre	\$ per tonne
GROSS RETURNS		
Crop Sales	1,604.04	55.1
Crop Insurance Receipts	0.00	
Miscellaneous Receipts	7.05	
A. TOTAL GROSS RETURN	1,611.09	55.34
VARIABLE COSTS		
Seed	141.90	
Fertilizer	108.14	
Chemicals	11.86	
Hail / Crop Insurance	13.65	
Association Fees and Research Levies	20.53	
Trucking and Marketing	147.14	
Machine Fuel (Net of Rebate)	67.65	
Irrigation Fuel	33.28	
Repairs - Machinery	70.00	
Repairs - Buildings	8.29	
Utilities, Insurance and Overhead	33.98	
Custom Work and Specialized Labour	13.90	
Operating Interest Paid	3.09	
Paid Labour and Benefits	42.79	
Unpaid Family and Operator Labour	14.75	
B. TOTAL VARIABLE COSTS	730.95	25.11
CAPITAL COSTS		
Cash Rent /Crop Share	214.31	
Taxes, Water Rates, Insurance	4.99	
Equipment/Building Depreciation	93.40	
Lease Payments	0.00	
Paid Capital Interest	18.49	
C. TOTAL CAPITAL COSTS	331.19	11.38
D. TOTAL CASH COSTS (B+C - Unpaid Labour - Depreciation)	953.99	32.77
E. TOTAL PRODUCTION COSTS (B+C)	1,062.14	36.49
F. NET RETURNS		
Gross Margin (A-D)	657.10	22.57
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	563.70	19.36
Return to Investment (A-E + Paid Capital Interest)	567.44	19.49
Return to Equity (A-E)	548.95	18.86
INVESTMENT		
Land and Buildings	646.00	
Machinery	676.02	

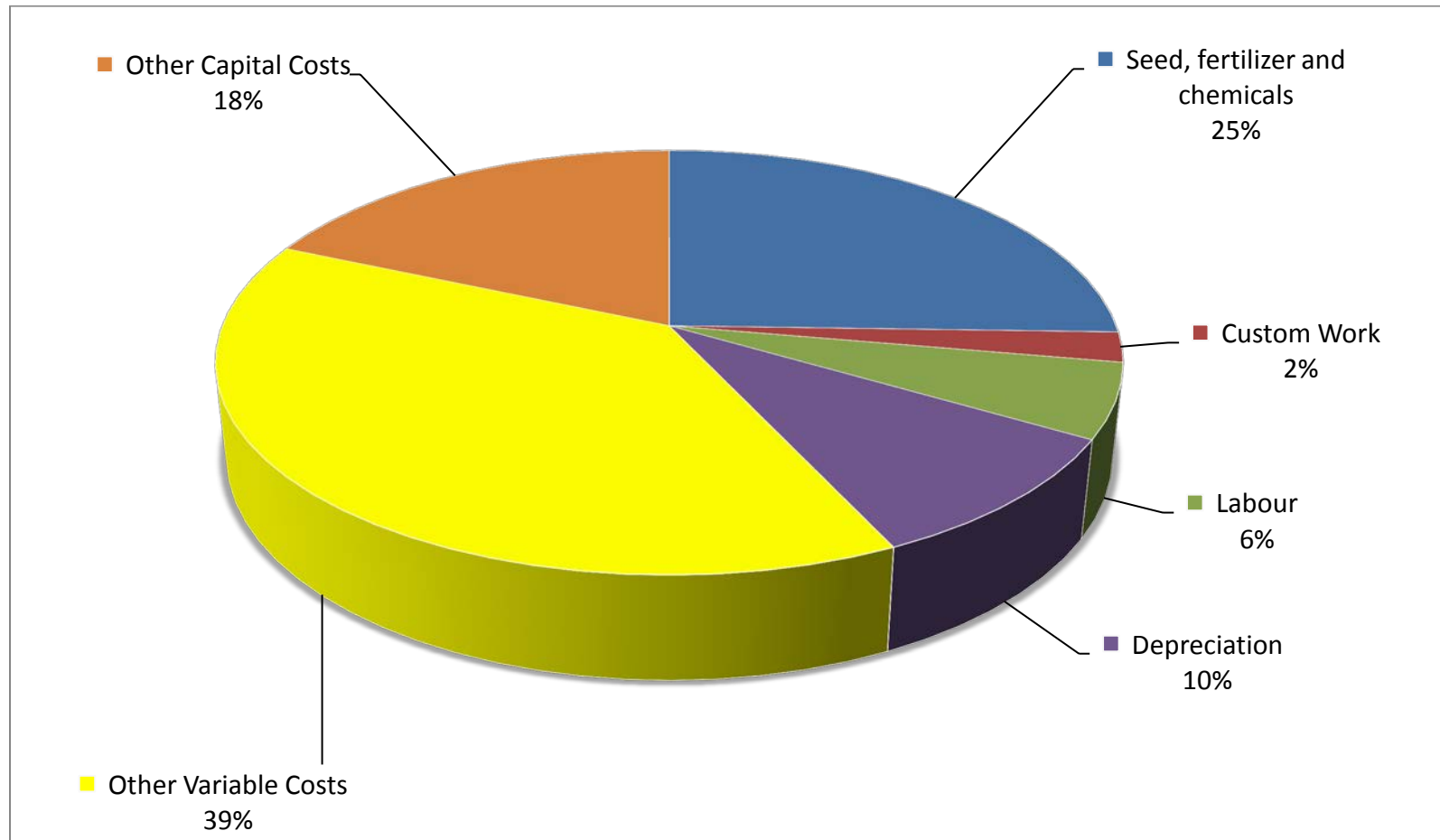
Source: Economics Branch, Alberta Agriculture and Rural Development, Edmonton, Alberta.

Figure 7: Variable Costs Breakdown for Sugar Beets, 2012



Source: Economics Branch, Alberta Agriculture and Rural Development, Edmonton, Alberta.

Figure 8: Breakdown of Total Production Costs for Sugar Beet Production, 2012



Source: Economics Branch, Alberta Agriculture and Rural Development, Edmonton, Alberta.

SECTION V

SUGAR BEET PRODUCTION COSTS AND RETURNS BY SIZE OF OPERATION, 2012

The study sample of twenty four (24) sugar beet fields was divided into three groups by size of field. Main objective of analyzing the data by size of field was to study the economies of scale, i.e., whether the size of field had any effect on net returns and overall sugar beet production costs. Following are the three groups: Group I (Up to 50 Acres), Group II (51 to 100 Acres), and Group III (Over 100 Acres). To preserve confidentiality, the costs and returns information for Group I, was not included in this report because the number of fields was less than three.

Group II (51-100 Acres)

Table 5 presents production costs and returns for sugar beet producers in Group II. The number of sugar beet fields in Group II was nine with an average size of 74.44 acres or about 26 percent of the area surveyed for the 2012 study. Average yield for this group of beet producers was 28.46 tonnes per acre. This yield was lower by about 0.07 tonne per acre compared to Group III (Over 100 Acres) which was estimated at 28.53 tonnes per acre.

Revenue from beet sales for Group II participants was \$1,568 per acre. When crop insurance and miscellaneous receipts were added to beet sales, gross return per acre increased to \$1,592 per acre or \$55.95 per tonne. The variable costs for this group averaged approximately \$766 per acre or \$26.92 per tonne. Average capital costs were estimated at about \$212 per acre (\$7.46 per tonne). Total cash costs were \$855 per acre or \$30.06 per tonne. Total production costs for study participants in Group II amounted to \$978 per acre or \$34.38 per tonne. This was about eight percent (\$90 per acre or \$3.08 per tonne) lower compared with that of Group III.

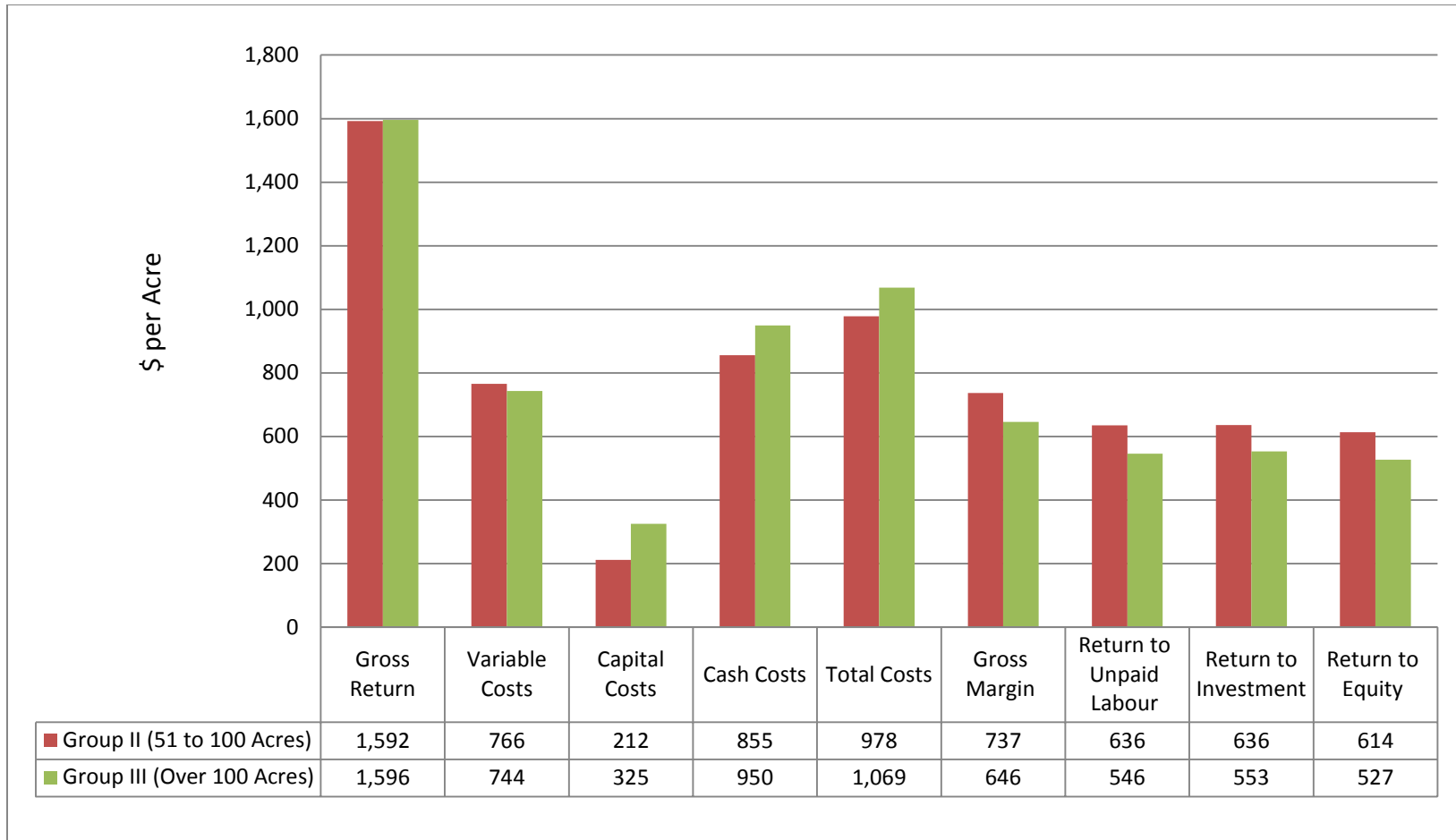
The net returns for this Group were all positive. The gross margin averaged \$737 per acre (\$25.90 per tonne). Return to unpaid labour was \$636 per acre (\$22.33 per tonne). The return to investment was estimated at \$636 per acre (\$22.35 per tonne) and return to equity was \$614 per acre (\$21.57 per tonne). Detailed breakdown of gross returns, variable costs, capital costs, total production costs and net returns for Group II participants are presented in Table 5. The comparison of the costs and returns by size of operation on per acre and per tonne basis are presented in Figures 9 and 10 respectively.

Table 5: Sugar Beet Production Costs and Returns (51-100 Acres), 2012 (9 Enterprises)

Acres Cropped (acres)	74.44	
Yield Per Acre (tonne)	28.46	
	\$ per acre	\$ per tonne
GROSS RETURNS		
Crop Sales	1,568.31	55.10
Crop Insurance Receipts	13.77	
Miscellaneous Receipts	10.33	
A. TOTAL GROSS RETURN	1,592.41	55.95
VARIABLE COSTS		
Seed	141.9	
Fertilizer	108.52	
Chemicals	15.35	
Hail / Crop Insurance	19.18	
Association Fees and Research Levies	20.41	
Trucking and Marketing	136.66	
Machine Fuel (Net of Rebate)	72.23	
Irrigation Fuel	51.84	
Repairs - Machinery	71.15	
Repairs - Buildings	6.8	
Utilities, Insurance and Overhead	34.39	
Custom Work and Specialized Labour	29.2	
Operating Interest Paid	1.41	
Paid Labour and Benefits	35.52	
Unpaid Family and Operator Labour	21.52	0.76
B. TOTAL VARIABLE COSTS	766.08	26.92
CAPITAL COSTS		
Cash Rent /Crop Share	48.79	1.71
Taxes, Water Rates, Insurance	39.86	1.40
Equipment/Building Depreciation	101.49	3.57
Lease Payments	0.00	0.00
Paid Capital Interest	22.20	0.78
C. TOTAL CAPITAL COSTS	212.34	7.46
D. TOTAL CASH COSTS (B+C - Unpaid Labour - Depreciation)	855.41	30.06
E. TOTAL PRODUCTION COSTS (B+C)	978.42	34.38
F. NET RETURNS		
Gross Margin (A-D)	737.00	25.90
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	635.51	22.33
Return to Investment (A-E + Paid Capital Interest)	636.19	22.35
Return to Equity (A-E)	613.99	21.57
INVESTMENT		
Land and Buildings	4,501.59	
Machinery	987.54	

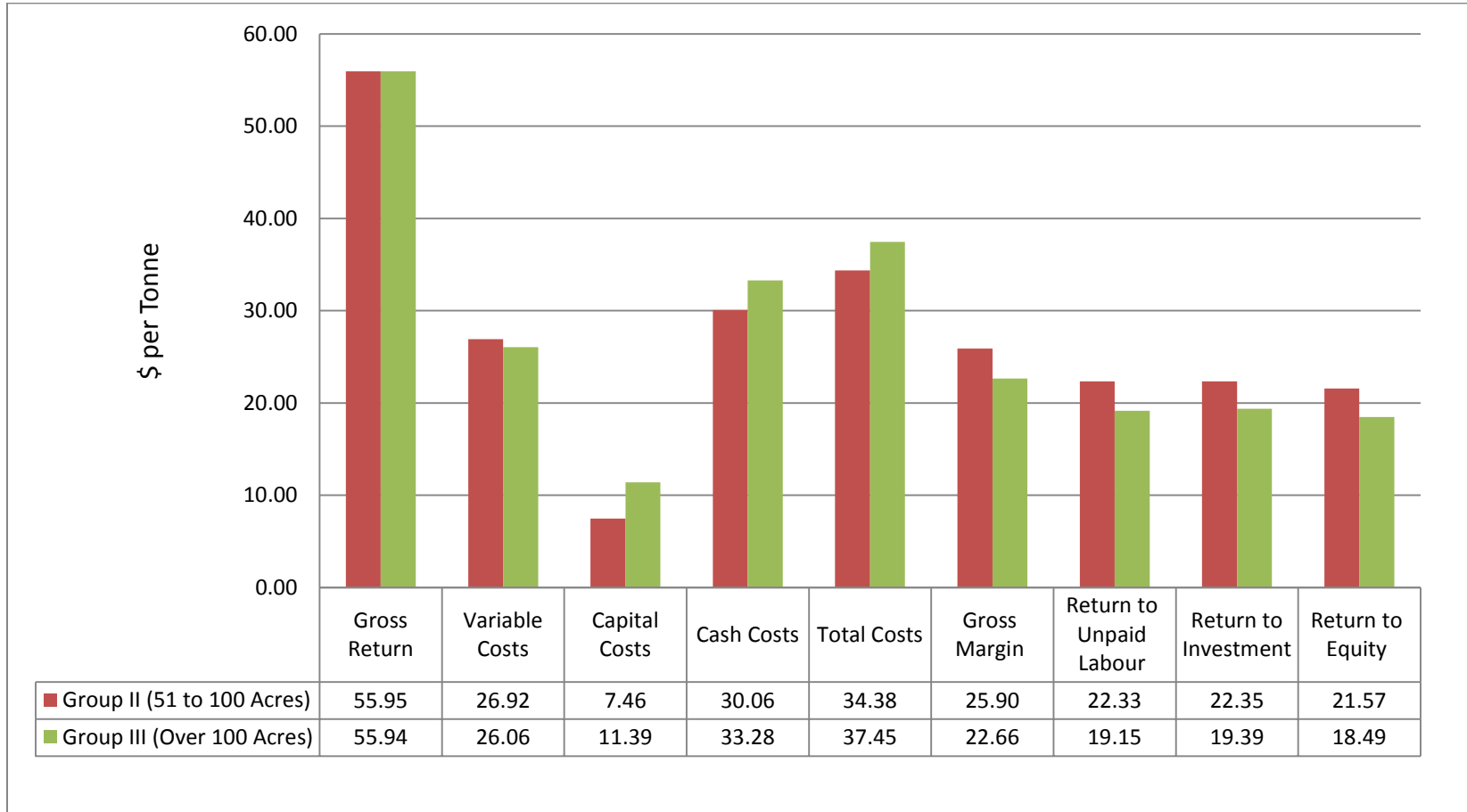
Source: Economics Branch, Alberta Agriculture and Rural Development, Edmonton, Alberta.

Figure 9: Sugar Beet Costs and Returns by Size of Operation, 2012 (\$ per Acre)



Source: Economics Branch, Alberta Agriculture and Rural Development, Edmonton, Alberta.

Figure 10: Sugar Beet Costs and Returns by Size of Operation, 2011 (\$ per Tonne)



Source: Economics Branch, Alberta Agriculture and Rural Development, Edmonton, Alberta.

Group III (Over 100 Acres)

Results for Group III beet participants are presented in Table 6. There were fourteen (14) beet fields with an average field size of about 132 acres. This Group represented about 72 percent of the sugar beet area surveyed for the 2012 crop. Average yield per acre for this group was at 28.53 tonnes, higher by about 0.07 tonne per acre compared with Group II.

Average gross revenue for participants in Group III amounted to \$1,596 per acre or \$55.94 per tonne. Variable costs were estimated at \$744 per acre (\$26.06 per tonne). Capital costs for this group were estimated at \$325 per acre (\$11.39 per tonne). Average total production costs for these fourteen (14) sugar beet fields amounted to \$1,069 per acre or \$37.45 per tonne. Detailed breakdown of costs for Group III is presented in Table 6.

As shown in Table 6, all the net returns were positive. Gross margin was estimated at \$646 per acre or \$22.66 per tonne. Average net returns to unpaid labour and investment were \$546 per acre (\$19.15 per tonne) and \$553 per acre (\$19.39 per tonne), respectively. Return to equity amounted to \$527 per acre or \$18.49 per tonne.

Figures 9 and 10 shows that the average net returns for Group III (over 100 acres) were lower compared with those of Group II (51 - 100 Acres). While study participants in Group III had somewhat lower variable costs, their average capital costs were higher by about \$113 per acre or \$3.93 per tonne.

Table 6: Sugar Beet Production Costs and Returns (Over 100 Acres), 2012 (14 Enterprises)

Acres Cropped (acres)	131.79	
Yield Per Acre (tonne)	28.53	
	\$ per acre	\$ per tonne
GROSS RETURNS		
Crop Sales	1,571.83	55.10
Crop Insurance Receipts	17.9	
Miscellaneous Receipts	6.25	
A. TOTAL GROSS RETURN	1,595.98	55.94
VARIABLE COSTS		
Seed	141.9	
Fertilizer	111.39	
Chemicals	11.51	
Hail / Crop Insurance	17.18	
Association Fees and Research Levies	20.42	
Trucking and Marketing	139.19	
Machine Fuel (Net of Rebate)	68.47	
Irrigation Fuel	36.28	
Repairs - Machinery	67.21	
Repairs - Buildings	8.17	
Utilities, Insurance and Overhead	35.3	
Custom Work and Specialized Labour	22.33	
Operating Interest Paid	3.79	
Paid Labour and Benefits	41.53	
Unpaid Family and Operator Labour	18.89	0.66
B. TOTAL VARIABLE COSTS	743.56	26.06
CAPITAL COSTS		
Cash Rent /Crop Share	187.53	6.57
Taxes, Water Rates, Insurance	11.6	0.41
Equipment/Building Depreciation	100.11	3.51
Lease Payments	0.00	0.00
Paid Capital Interest	25.78	0.90
C. TOTAL CAPITAL COSTS	325.02	11.39
D. CASH COSTS (B+C - Unpaid Labour - Depreciation)	949.58	33.28
E. TOTAL PRODUCTION COSTS (B+C)	1,068.58	37.45
F. NET RETURNS		
Gross Margin (A-D)	646.40	22.66
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	546.29	19.15
Return to Investment (A-E + Paid Capital Interest)	553.18	19.39
Return to Equity (A-E)	527.40	18.49
INVESTMENT		
Land and Buildings	1,293.40	
Machinery	772.65	

Source: Economics Branch, Alberta Agriculture and Rural Development, Edmonton, Alberta.

MANAGEMENT PROFILE

Sugar beet production is an intensive farming operation and requires a higher degree of management skills. For this particular analysis, the 2012 study sample of twenty four (24) fields was divided into two groups (small 1/3 and large 1/3) to examine management factors. Overall level of management was determined by the following four factors:

1. Yield
2. Cash Costs
3. Gross Margin
4. Return to Equity

Table 7 provides a cross-section of these management factors. Each of these factors was rated 1 to 3 for the small, middle and large 1/3 producers, respectively. However, information presented in Table 8 is only for the small 1/3 and the large 1/3 sugar beet producers. Each producer was given an average rating for the above four factors. From these averages, the large 1/3 producer in all four factors were rated 3 and the small 1/3 were rated 1. The last column in Table 8 shows a blend of 1 to 3 for each factor, depending on whether that group had more top managers (closer to 3) or not.

For each factor, estimates for the large 1/3 group are presented in the first line and estimates for the small 1/3 group in the second line. As shown in Table 8, sugar beet yield per acre in 2012, was higher for the large 1/3 group (31.01 tonnes) compared with the small 1/3 group (23.68 tonnes). Cash costs for the large 1/3 group of producers was \$1,002 per acre compared with \$775 for the small 1/3 group. Total costs for the large 1/3 group of producers was \$1,150 per acre compared with \$877 for the small 1/3 group. Gross margin for the large 1/3 group was \$841 per acre compared with \$506 per acre for the small 1/3 group. Return to equity for the large 1/3 group was \$729 per acre compared to \$371 per acre for the bottom 1/3 (small) group.

Higher management rating is associated with the high yield, gross margin and return to equity values for the large 1/3 group relative to the small 1/3. However for cash costs, higher management rating is associated with the low value for the small 1/3 group relative to the large 1/3. Overall management rating between the two groups was significantly apart, i.e. 3 versus 1 (large versus small). The overall management factor includes yield, cash costs, gross margin and return to equity.

Table 7: Profile of Management Factors for Sugar Beet Production, 2012

PROFILE OF MANAGEMENT FACTORS FOR SMALL 1/3 AND LARGE 1/3 GROUPS OF SUGAR BEET PRODUCERS													
	Acres	Yield	Special Custom	Unpaid Labour	Cash Costs	Total Costs	Gross Margin	Return to Equity	Investment				Overall Management
									Land	Buildings	Machine	Irrigation	
Acres	135.75	29.14	14.25	17.76	963.23	1,078.03	648.73	533.93	0.00	618.09	725.74	0.00	1.91
	66.25	26.87	20.70	24.72	800.14	924.72	740.45	615.87	5,437.50	152.99	800.82	239.22	2.19
Yield (Tonne/Acre)	106.63	31.01	22.94	22.28	951.86	1,093.26	765.97	624.58	3,000.00	384.54	958.47	129.50	2.31
	93.88	23.68	46.83	33.12	834.53	960.25	551.54	425.81	2,687.50	294.37	637.85	249.95	1.50
Special Custom (\$/Acre)	113.00	27.96	69.77	38.40	943.15	1,100.07	644.48	487.56	2,625.00	361.23	772.32	347.75	1.81
	102.00	30.31	0.00	7.14	907.41	1,010.18	779.64	676.87	2,750.00	499.60	742.05	31.70	2.34
Unpaid Labour (\$/Acre)	88.00	24.33	48.64	40.83	817.85	958.54	604.01	463.31	3,937.50	270.29	630.73	347.75	1.91
	107.63	29.98	0.00	5.35	890.10	974.46	779.58	695.22	2,000.00	585.46	552.18	0.00	2.34
Cash costs (\$/Acre)	119.50	29.65	21.13	15.47	1,001.66	1,134.93	637.02	503.75	750.00	482.39	992.23	31.70	1.63
	73.25	26.18	24.83	29.40	774.73	881.30	727.98	621.41	4,687.50	249.25	537.84	207.53	2.16
Total Costs (\$/Acre)	119.88	28.47	44.94	25.12	996.26	1,149.97	606.97	453.26	2,000.00	355.89	1,031.83	171.92	1.66
	81.38	25.97	15.13	23.16	778.83	877.08	713.40	615.14	4,062.50	300.73	537.89	154.05	2.09
Gross Margin (\$/Acre)	94.75	30.26	33.94	20.20	856.05	969.21	840.88	727.72	4,000.00	443.05	555.60	251.85	2.69
	100.75	24.06	35.83	32.53	885.70	1,014.40	505.95	377.25	1,937.50	247.95	824.20	95.90	1.38
Return to Equity (\$/Acre)	94.38	30.14	20.70	13.97	857.05	962.63	834.90	729.32	3,375.00	494.54	555.65	207.53	2.72
	92.00	24.54	25.70	31.94	900.20	1,046.85	517.98	371.33	2,687.50	201.53	1,010.56	127.59	1.44
Land Investment (\$/Acre)	85.38	28.14	44.52	28.39	849.84	994.46	758.76	614.13	5,812.50	196.95	803.55	379.45	2.28
	125.88	28.95	4.13	13.60	930.09	1,028.54	673.66	575.21	0.00	743.39	532.36	0.00	2.09
Buildings Investment (\$/Acre)	127.00	28.95	4.13	13.60	922.34	1,020.79	681.42	582.97	0.00	743.39	532.36	0.00	2.25
	81.25	25.75	10.58	21.31	856.34	988.42	638.94	506.85	4,687.50	83.04	1,026.87	127.59	1.84
Machine Investment (\$/Acre)	84.38	24.85	32.58	27.86	893.01	1,052.16	557.47	398.33	3,437.50	151.69	1,087.18	281.64	1.56
	106.25	29.95	27.06	24.28	874.17	974.83	790.46	689.79	3,250.00	492.89	478.98	97.80	2.31
Irrigation Investment (\$/Acre)	92.25	26.89	44.52	34.95	910.88	1,085.26	618.17	443.79	4,250.00	173.40	1,065.14	379.45	1.94
	111.50	29.63	4.13	11.81	881.95	966.71	767.22	682.46	2,000.00	595.86	479.07	0.00	2.38
Overall Management* (\$/Acre)	94.13	30.26	33.94	20.20	858.97	972.13	837.95	724.79	4,000.00	443.05	555.60	251.85	3.00
	100.75	24.06	35.83	32.53	885.70	1,014.40	505.95	377.25	1,937.50	247.95	824.20	95.90	1.00
Weighted Average (\$/Acre)	106.46	28.33	23.78	19.77	920.75	1,040.50	668.22	548.48	1,667.32	502.72	716.89	111.80	2.00

* Overall Management Factor includes Yield, Cash Costs, Gross Margin and Return to Equity

SECTION VI

COMPARISON OF COSTS AND RETURNS, 2001-2012

Table 8 presents ten years comparison (2001 to 2012) of costs and returns for sugar beet production in Alberta. A graph of the gross return, total production costs, return to investment and return to equity are presented on Figure 11.

As shown on Table 8 or Figure 11, gross returns over the period ranged from \$636 per acre in 2002 to \$1,589 per acre in 2012. Average gross revenue for the 2012 beet study participants was estimated at \$1,589 per acre compared to \$1,274 per acre for the 2011 beet crop, an increase of approximately 25 percent. This increase in returns is primarily due to an increase in both yield and price received for the beet crop (i.e. approximately 20 percent and three percent respectively). The average yield reported by the study participants in 2012 was 28.33 tonnes per acre compared to 23.56 tonnes per acre in 2011. Similarly the average price in 2012 was \$55.10 per tonne compared to \$53.52 per tonne in 2011.

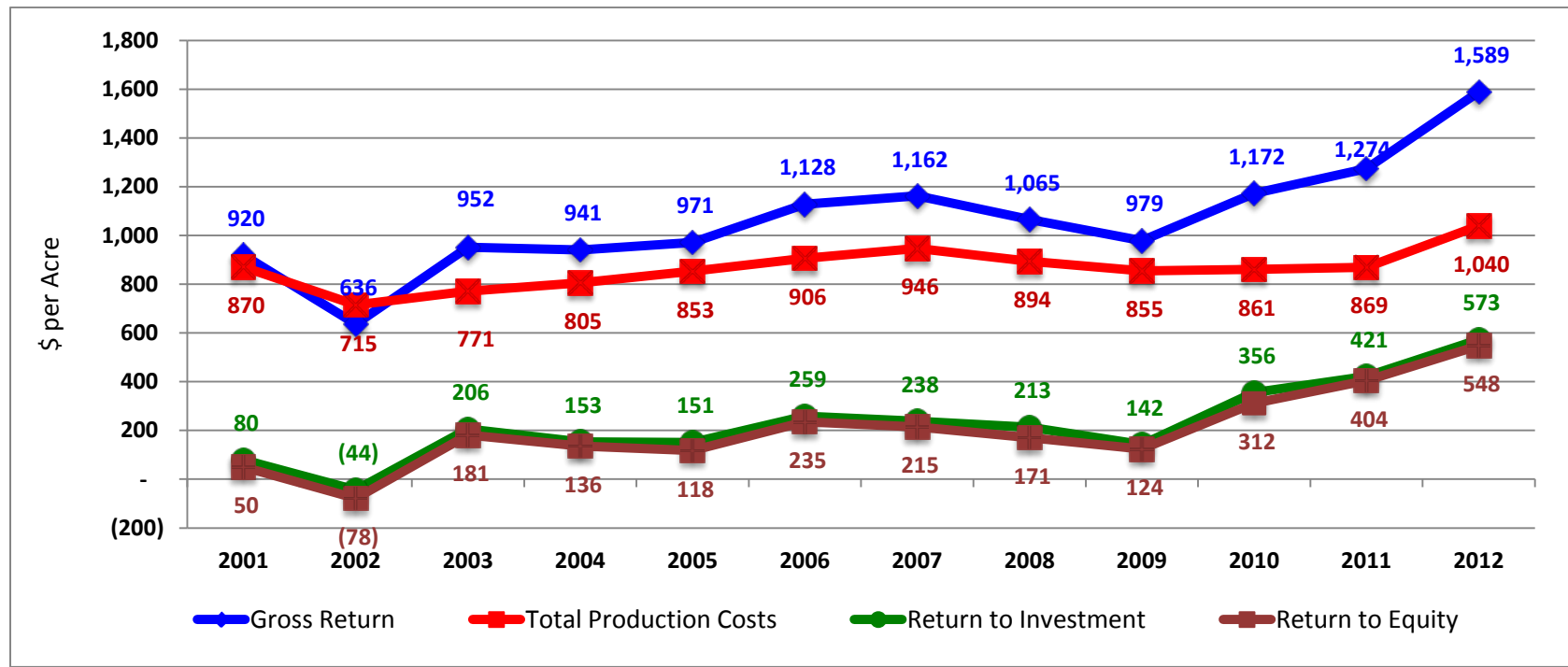
Total production costs over the period (2001 to 2012) ranged from \$715 in 2002 to \$1,040 per acre in 2012. Compared to 2011, total costs both variable and capital for the study participants in 2012 were high. Total variable, capital and production costs increased approximately 10 percent, 57 percent and 20 percent respectively compared to 2011.

As shown on Table 8 or Figure 11, net returns per acre (i.e. returns to unpaid labour, investment and equity) have varied considerably during the last twelve years (i.e. from 2001 to 2012). Average returns to unpaid labour ranged from negative \$18 per acre in 2002 to \$568 per acre in 2012. Average return to investment per acre ranged from negative \$44 per acre in 2002 to \$573 per acre in 2012. Return to equity ranged from negative \$78 per acre in 2002 to \$548 per acre in 2012. In comparison to 2011, the higher net return per acre realized in 2012 was due to the high increase in gross return.

Table 8: Comparison of Costs and Returns for Sugar Beet Production, 2001-2012 (\$ per acre)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Gross Return	920	636	952	941	971	1,128	1,162	1,065	979	1,172	1,274	1,589
Total Variable Costs	599	503	526	576	607	642	678	658	651	617	682	749
Total Capital Costs	271	212	245	224	246	251	269	236	204	244	187	293
Total Production Costs	870	715	771	805	853	906	946	894	855	861	869	1,040
Return to Unpaid Labour	113	-18	225	177	161	287	267	203	150	341	429	568
Return to Investment	80	-44	206	153	151	259	238	213	142	356	421	573
Return to Equity	50	-78	181	136	118	235	215	171	124	312	404	548

Figure 11: Comparison of Costs and Returns for Sugar Beet Production, 2001-2012 (\$ per acre)



SECTION VII

SUMMARY

A summary of the 2012 sugar beets production costs and returns is presented in Table 9. As mentioned earlier, the study sample was divided into two groups, i.e., beets produced on owned land (10 fields) and beets produced on rented land (14 fields). The area surveyed to develop the costs and returns information in 2012 was approximately 35 percent higher compared to the area surveyed for the 2011 beet crop.

As shown in Table 9, average gross returns based on crop sales, miscellaneous receipts and government program payment amounted to \$1,589 per acre (\$56.09 per tonne) for the 2012 sugar beet crop. For beets produced on owned and rented land, gross returns were \$1,539 per acre (\$57.92 per tonne) and \$1,611 per acre (\$55.34 per tonne), respectively.

Average seed, fertilizer and chemical costs for sugar beet production in 2012 were estimated at \$265 per acre (\$9.36 per tonne) for the study sample. These costs were \$272 per acre (\$10.24 per tonne) for beets grown on owned land and \$262 per acre (\$9.00 per tonne) for rented land.

Miscellaneous costs (hail/crop insurance, utilities, other insurance, association fees and research levies) amounted to \$73 per acre (\$2.56 per tonne) for the study sample; \$82 per acre (\$3.10 per tonne) for beets produced on owned land and \$68 per acre (\$2.34 per tonne) for beets produced on rented land.

Fuel and repairs (machinery and building) amounted to \$186 per acre (\$6.57 per tonne) for the study sample in 2012. For beets grown on owned land, fuel and repairs were estimated at \$201 per acre (\$7.58 per tonne) compared to \$179 per acre (\$6.16 per tonne) for beets produced on rented land.

Average cost for custom work and specialized labour amounted to \$24 per acre (\$0.84 per tonne) for the study sample, \$46 per acre (\$1.73 per tonne) for owned land and \$14 per acre (\$0.48 per tonne) for beets produced on rented land.

Average labour cost (paid and unpaid) was \$59 per acre (\$2.09 per tonne) for the study sample. It was \$62 per acre (\$2.35 per tonne) for beets grown on owned land and \$58 per acre (\$1.98 per tonne) for rented land.

Average operating interest paid per acre was approximately \$3 per acre (\$0.11 per tonne), \$3 per acre (\$0.13 per tonne), and \$3 per acre (\$0.11 per tonne) for the study sample, owned land and rented land groups, respectively.

Trucking and marketing costs were calculated at \$139 per acre (\$4.90 per tonne) for the study sample, \$120 per acre (\$4.52 per tonne) for beets grown on owned land and \$147 per acre (\$5.05 per tonne) for beets grown on rented land.

Average total variable cost for the 2012 sugar beet crop was estimated at \$749 per acre (\$26.42 per tonne) for the study sample; \$788 per acre (\$29.65 per tonne) for the owned land group and \$731 per acre (\$25.11 per tonne) for beets produced on rented land.

Average total capital costs amounted to \$292 per acre (\$10.30 per tonne) for the study sample. These were \$204 per acre (\$7.67 per tonne) for the group who produced beets on owned land and \$331 per acre (\$11.38 per tonne) for beets grown on rented land. About 65 percent of the total capital costs for beets grown on rented land are land rental fees.

Average total production costs for the 2012 sugar beet crop (variable costs + capital costs) amounted to \$1,040 per acre (\$36.73 per tonne) for the study sample. For beets grown on owned and rented land, average total production costs per acre were at \$992 per acre (\$37.32 per tonne) and \$1,062 per acre (\$36.49 per tonne) respectively.

Details on gross returns and each of the various cost items for the three groups, i.e. study sample, beets produced on owned and rented land are presented in Table 9.

The net returns for the study sample were all positive. Average gross margin was estimated at \$668 per acre (\$23.59 per tonne). Average return to unpaid labour was estimated at \$568 per

acre (\$20.06 per tonne) and returns to investment and equity were estimated at \$573 per acre (\$20.23 per tonne) and \$548 per acre (\$19.36 per tonne), respectively.

Average gross margin for beets grown on owned land was \$693 per acre or \$26.08 per tonne. Return to unpaid labour was estimated at \$578 per acre (\$21.76 per tonne). Returns to investment and equity were \$586 per acre (\$22.06 per tonne) and \$547 per acre (\$20.60 per tonne) respectively.

Average gross margin for beets grown on rented land was \$657 per acre (\$22.57 per tonne). Return to unpaid labour was \$564 per acre (\$19.36 per tonne). Return to investment was \$567 per acre (\$19.49 per tonne) and return to equity was \$549 per acre (\$18.86 per tonne).

Table 9: Summary of Sugar Beet Production Costs and Returns, 2012

	Study Sample		Owned Land		Rented Land	
Enterprises	24		10		14	
Acreage Cropped (acres)	106.46		78.80		126.21	
Yield Per Acre (tonnes)	28.33		26.58		29.11	
	\$ per acre	\$ per tonne	\$ per acre	\$ per tonne	\$ per acre	\$ per tonne
GROSS RETURNS	1,589	56.09	1,539	57.92	1,611	55.34
VARIABLE COSTS						
Input Costs (Seed, Fertilizer and Chemicals)	265	9.36	272	10.24	262	9.00
Miscellaneous	73	2.56	82	3.10	68	2.34
Fuel and Repairs (Machine and Building)	186	6.57	201	7.58	179	6.16
Custom Work and Specialized Labour	24	0.84	46	1.73	14	0.48
Labour (Paid and Unpaid)	59	2.09	62	2.35	58	1.98
Operating Interest	3	0.11	3	0.13	3	0.11
Trucking and Marketing	139	4.90	120	4.52	147	5.05
B. TOTAL VARIABLE COSTS	749	26.42	788	29.65	731	25.11
C. TOTAL CAPITAL COSTS	292	10.30	204	7.67	331	11.38
D. TOTAL CASH COSTS (B+C - Unpaid Labour - Depreciation)	921	32.50	846	31.84	954	32.77
E. TOTAL PRODUCTION COSTS (B+C)	1,040	36.73	992	37.32	1,062	36.49
F. NET RETURNS						
Gross Margin (A-D)	668	23.59	693	26.08	657	22.57
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	568	20.06	578	21.76	564	19.36
Return to Investment (A-E + Paid Capital Interest)	573	20.23	586	22.06	567	19.49
Return to Equity (A-E)	548	19.36	547	20.60	549	18.86

* Miscellaneous costs include; hail/crop insurance, utilities, other insurance, board fees and research levies.

APPENDIX

SUGAR BEET PRODUCTION COSTS AND RETURNS USING PROVINCIAL YIELD, 2012

Sugar beet production costs and returns data presented in Table 10 are based on a provincial average yield of 27.69 tonnes in 2012. As mentioned at the beginning of the report, average yield for the study sample of twenty four (24) fields was estimated at 28.33 tonnes per acre. This average yield of 28.33 tonnes was two percent higher (0.64 tonnes) compared to the provincial average of 27.69 tonnes.

Assuming other receipts (crop insurance and miscellaneous) were the same for sugar beet growers for the 2012 beet crop, total gross revenue was calculated to be \$1,554 per acre or (\$56.11 per tonne). Variable and capital costs presented in Table 10 were also assumed to be the same as for the study sample. The purpose of including this data (Table 10) in the report was to determine how net returns could be impacted, if industry average yield was used to calculate sugar beet production costs and returns.

Average gross margin was estimated at \$633 per acre or \$22.86 per tonne with the provincial yield compared with \$668 per acre or \$23.59 per tonne for the study sample yield. Return to unpaid labour was \$533 per acre or \$19.25 per tonne with the provincial yield whereas for the study sample it was \$568 per acre or \$20.06 per tonne. Returns to investment and equity were estimated at \$538 per acre (\$19.43 per tonne) and \$513 per acre (\$18.54 per tonne), respectively, with the provincial yield. Similarly, returns to investment and equity for the study sample were estimated at \$573 per acre (\$20.23 per tonne) and \$548 per acre (\$19.36 per tonne), respectively.

Details on gross revenue, costs and net returns for the 2012 beet crop using the provincial average yield of 27.69 tonnes per acre are presented in Table 10.

Table 10: Sugar Beet Production Costs and Returns Based on Provincial Yield, 2012

Acres Cropped (acres)	106.46	
Yield Per Acre (tonne)	27.69	
	\$ per acre	\$ per tonne
GROSS RETURNS		
Crop Sales	1,525.72	55.10
Crop Insurance Receipts	20.79	
Miscellaneous Receipts	7.22	
A. TOTAL GROSS RETURN	1,553.73	56.11
VARIABLE COSTS		
Seed	141.90	
Fertilizer	110.61	
Chemicals	12.56	
Hail / Crop Insurance	17.63	
Association Fees and Research Levies	20.38	
Trucking and Marketing	138.83	
Machine Fuel (Net of Rebate)	69.29	
Irrigation Fuel	41.35	
Repairs - Machinery	67.74	
Repairs - Buildings	7.68	
Utilities, Insurance and Overhead	34.56	
Custom Work and Specialized Labour	23.78	
Operating Interest Paid	3.19	
Paid Labour and Benefits	39.30	
Unpaid Family and Operator Labour	19.77	
B. TOTAL VARIABLE COSTS	748.57	27.03
CAPITAL COSTS		
Cash Rent /Crop Share	148.22	
Taxes, Water Rates, Insurance	18.97	
Equipment/Building Depreciation	99.98	
Lease Payments	0	
Paid Capital Interest	24.75	
C. TOTAL CAPITAL COSTS	291.92	10.54
D. TOTAL CASH COSTS (B+C - Unpaid Labour - Depreciation)	920.74	33.25
E. TOTAL PRODUCTION COSTS (B+C)	1,040.49	37.58
F. NET RETURNS		
Gross Margin (A-D)	632.99	22.86
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	533.01	19.25
Return to Investment (A-E + Paid Capital Interest)	537.99	19.43
Return to Equity (A-E)	513.24	18.54
INVESTMENT		
Land and Buildings	2,170.04	
Machinery	828.69	

Source: Economics Branch, Alberta Agriculture and Rural Development, Edmonton, Alberta.