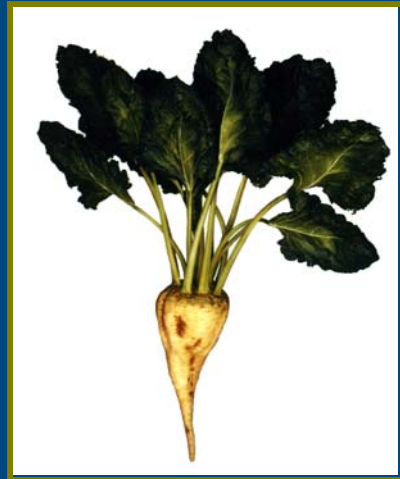


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## The Economics of Sugar Beet Production in Alberta 2011



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**THE ECONOMICS OF  
SUGAR BEET PRODUCTION**

**IN ALBERTA**

**2011**

by

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Economics Branch

Economics and Competitiveness Division  
Alberta Agriculture and Rural Development

January, 2013

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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 2011 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 2011 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. A total of 14 producers were selected to be surveyed personally to obtain detailed cost and return information. However, due to scheduling and other issues, data from only ten (10) sugar beet producers were analyzed. These 10 beet producers provided data on twenty one (21) fields (owned and rented). Each of these fields was recorded separately. In total, these 21 fields represent about 6 percent of the total area of sugar beets harvested in 2011.



## SECTION II

### METHOD OF ANALYSIS

The raw data obtained from the ten sugar beet producers with twenty one 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 and Competitiveness Division 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 basis<sup>1</sup>. These results were used to allocate

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<sup>1</sup> 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.

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 irrigation<sup>2</sup>.

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.

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<sup>2</sup> 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, 1980-2012

Table 1 shows a historical data on sugar beet production in Alberta from 1980 to 2012. 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 2012 on acres contracted, acres planted, acres harvested, tonnage harvested and yield per acre. Figure 6 shows trends in beet prices from 1980 to 2011. The final price for the 2012 sugar beet crop will be available sometime in October/November 2013.

During the last thirty-two (32) 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 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 7 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 4 percent to 28,800 acres, the lowest since 1980.

Compared to 2003, sugar beet area contracted for the 2004 crop increased by almost 23 percent. For the 2005 beet crop, area contracted for beet production decreased by 3 percent over the previous year to 34,302 acres. In 2006, area contracted for beets increased by about 8 percent to 37,204 acres. Area contracted in 2007 decreased back to the level of 2005 due to record tonnage production in 2006. Due to the higher tonnage production in 2006 and 2007,

the sugar factory negotiated to decrease area contracted by over 46 percent in 2008. In 2009, area contracted increased to 29,650 acres, an increase of about 61 percent compared to 2008. In 2010, contracted area further increased by 2.4 percent to 30,379 acres. About 33,598 acres were contracted in 2011, an increase of about 11 percent compared to 2010. Sugar beet acres contracted in 2012, decreased by about 9 percent compared to 2011.

Sugar beet tonnage harvested over the period 1980 to 2012, 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. As illustrated by Figure 4, sugar beet tonnage harvested in Alberta trended upwards with production of about 827,434 tonnes in 2012.

Yield per acre has also shown considerable variation over the period 1980 to 2012, ranging from 15.22 tonnes per acre in 2002 to about 27 tonnes per acre in 2012. 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 illustrated by Figure 5, yield per acre has trended positively over the last thirty-two years.

Beet prices have also fluctuated quite dramatically during the last 31 years, i.e., from 1980 to 2011. Prices have ranged from about \$31 per tonne in 1986 to \$67 per tonne in 1980, a 116 percent difference<sup>3</sup>. As shown in Table 1, the final price received by beet growers in 2011 was \$53.52 per tonne, an increase of about 0.7 percent compared to the 2010 price. This translates to payments of over \$41 million to sugar beet growers given the 2011 provincial harvested beets of 784,500 tonnes. It is important to note that the 2011 beet crop was rated as the highest quality beet crop ever in Alberta beet growing history.

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

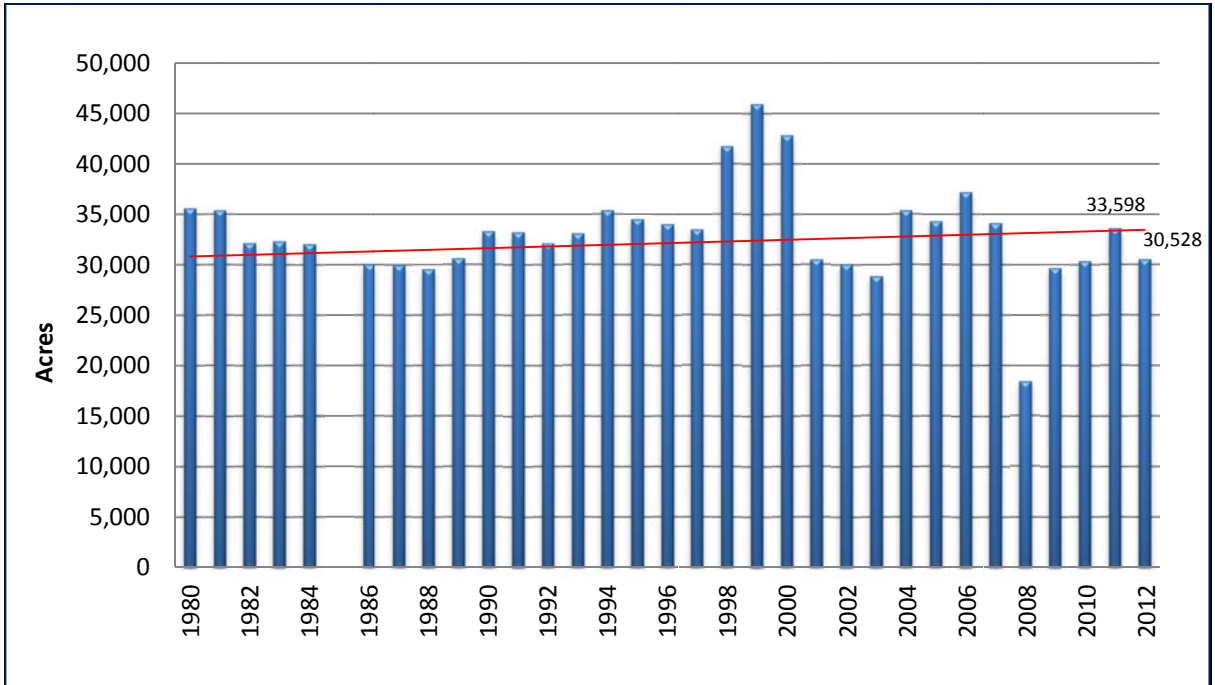
**Table 1: Historical Data on Sugar Beet Production in Alberta, 1980-2012**

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	N/A

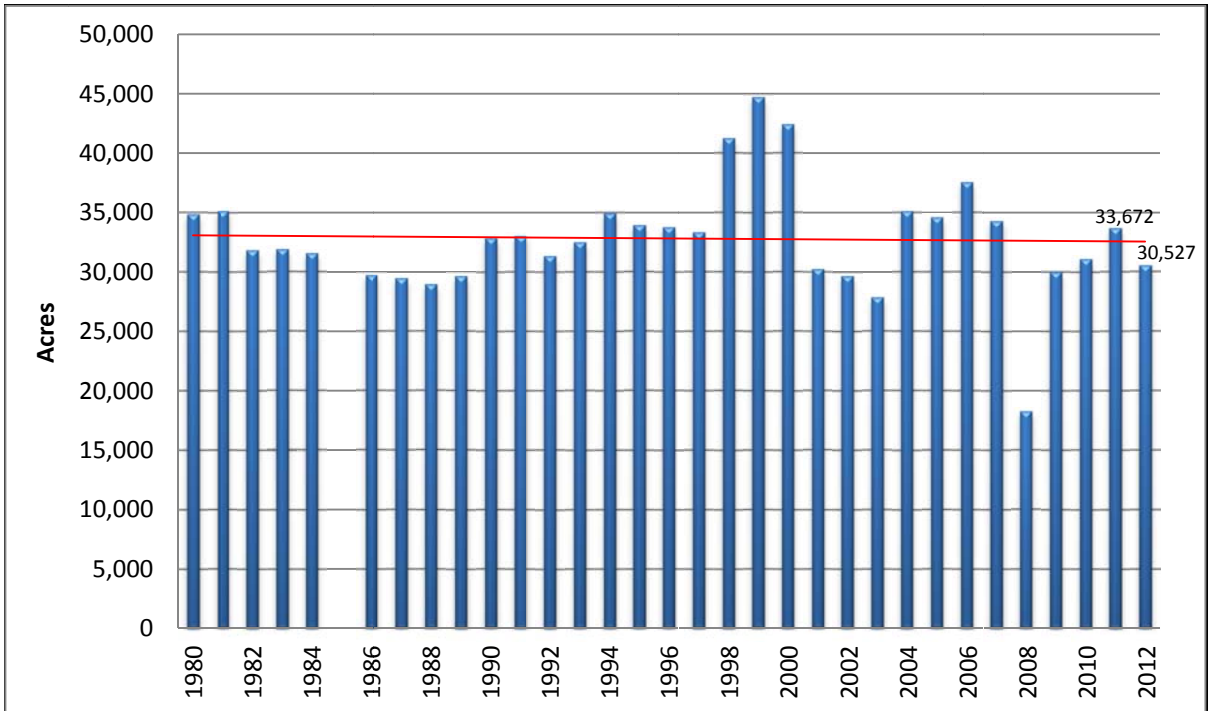
Source: Alberta Sugar Beet Growers, 86th Annual Report, Taber, Alberta.

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

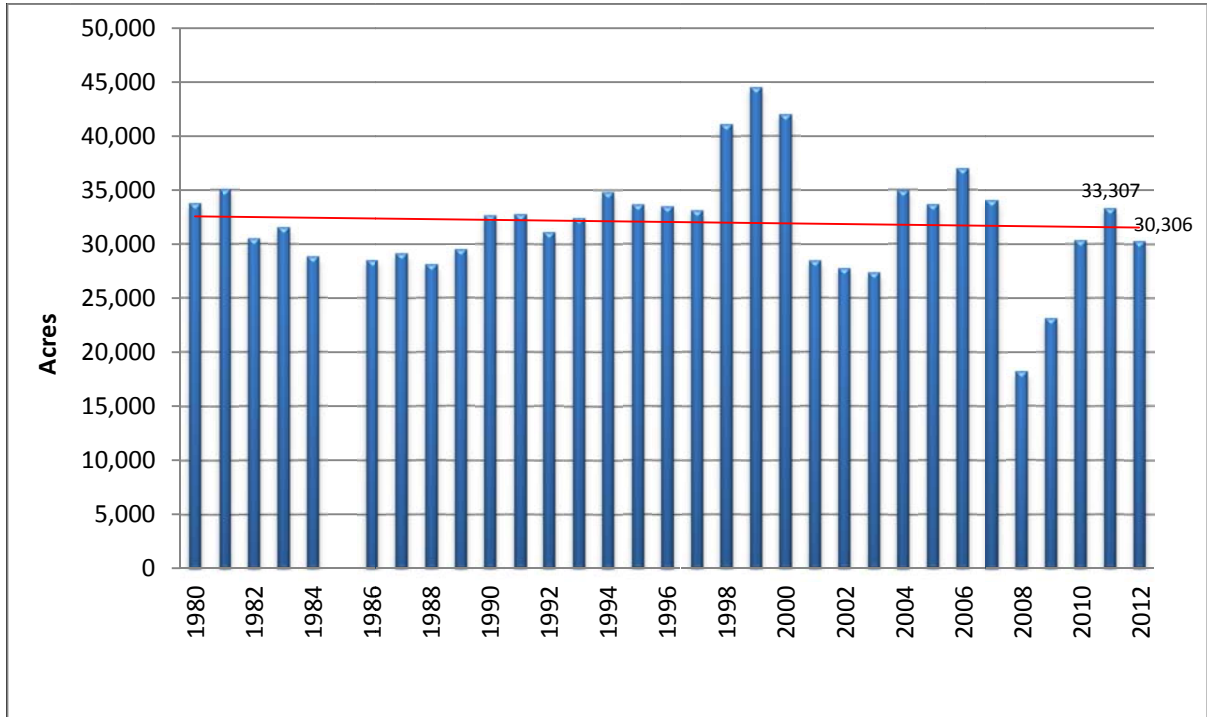
**Figure 1: Sugar Beet Acres Contracted in Alberta, 1980-2012**



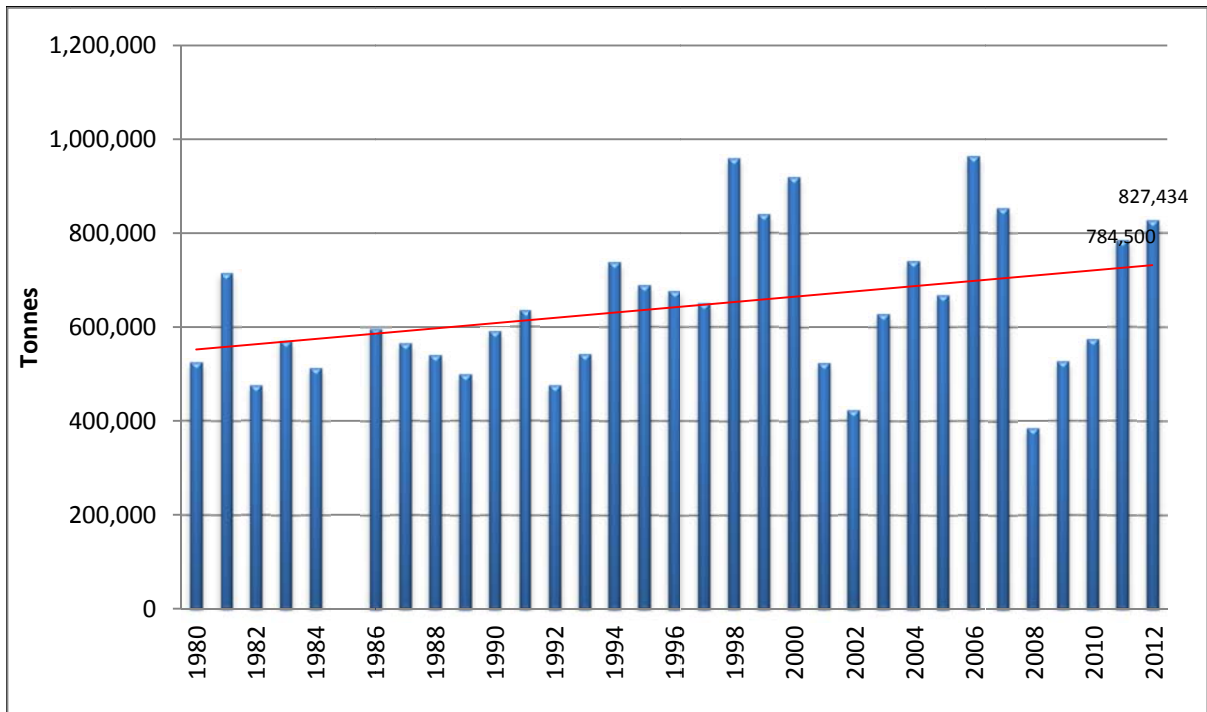
**Figure 2: Sugar Beet Acres Planted in Alberta, 1980-2012**



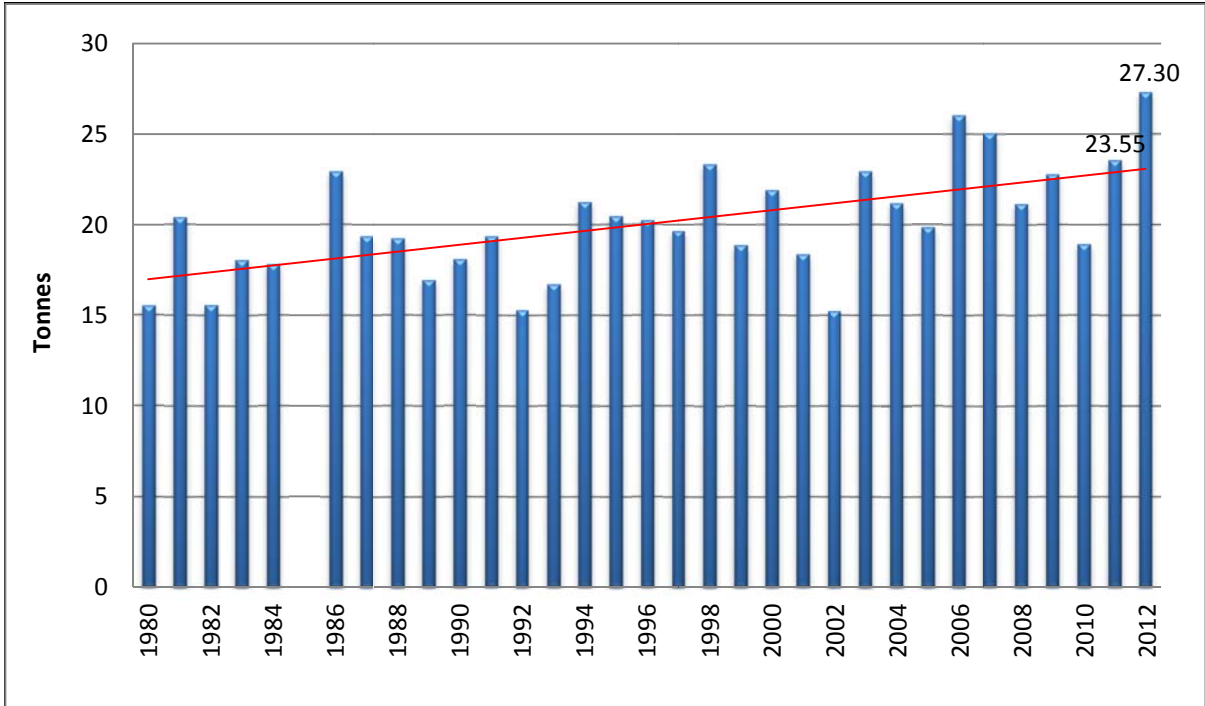
**Figure 3: Sugar Beet Acres Harvested in Alberta, 1980-2012**



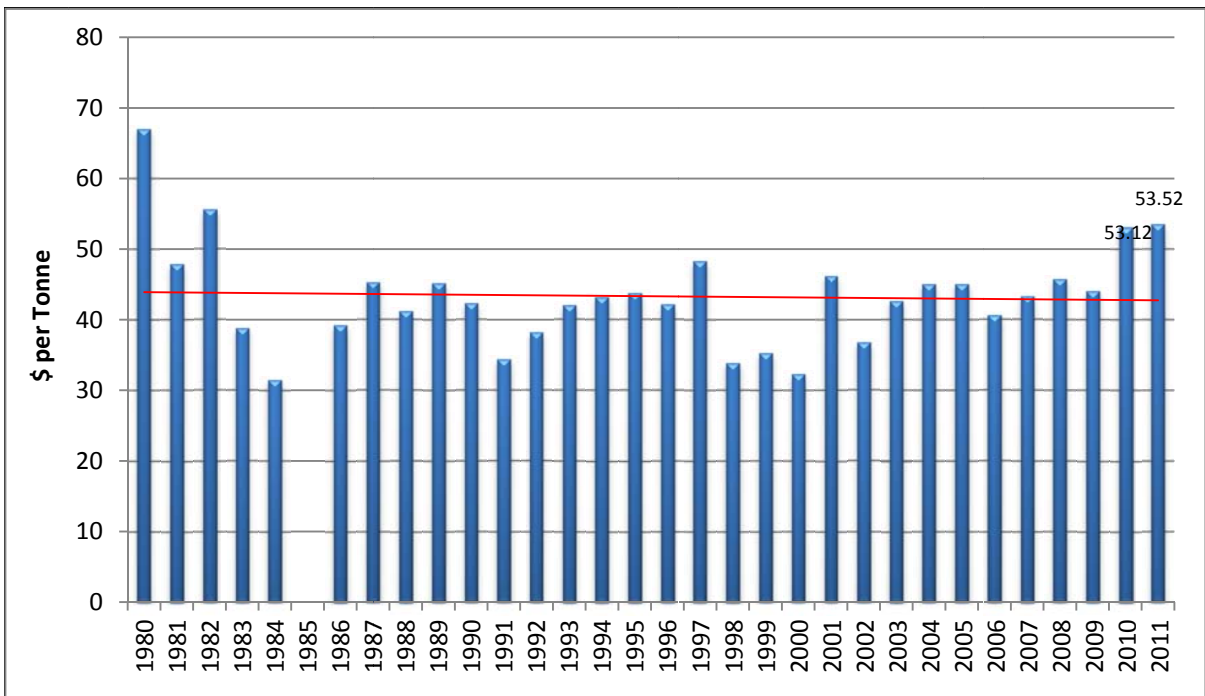
**Figure 4: Sugar Beet Tonnage Harvested in Alberta, 1980-2012**



**Figure 5: Sugar Beet Yield per Acre in Alberta (Tonnes), 1980-2012**



**Figure 6: Sugar Beet Price per Tonne in Alberta, 1980-2011**





## SECTION IV

### SUGAR BEET PRODUCTION COSTS AND RETURNS, 2011

The 2011 sugar beet study sample comprised of ten (10) sugar beet producers (21 fields) who provided detailed information on their operations. The study sample of beet producers was considered adequate to develop costs and returns data for the 2011 beet crop. It was divided into two groups to develop production costs and returns for beets grown on owned land (14 fields) and beets grown on rented land (7 fields).

#### Gross Returns

Table 2 presents production costs and returns for the entire study sample of 10 sugar beet producers (21 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 90 acres and these producers reported an average yield of 23.56 tonnes per acre. This average yield of 23.56 tonnes was higher by 0.01 tonnes compared to the provincial average of 23.55 tonnes. With an estimated price of \$53.52 per tonne, average value of production was estimated at \$1,261 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 \$1,274 per acre or \$54.06 per tonne. The final price for the 2011 beet crop was announced in November 2012. 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 \$235 per acre or approximately \$9.99 per tonne. In 2011, seed costs for beet production increased by 2% compared to 2010. The entire crop in 2011 was planted to Roundup Ready sugar beets (GMO seed). Use of this seed led to a reduction in the costs of chemicals by about 34 percent.

Average trucking/marketing costs, fuel, repair (machinery and buildings) and utilities costs for the entire study sample was estimated at approximately \$294 per acre or \$12.48 per tonne (Table 2). These costs were estimated at about \$306 per acre or \$12.82 per tonne for beets produced on owned land (Table 3) and about \$263 per acre or \$11.59 per tonne for beets produced on rented land (Table 4).

Other most significant cost items for the 2011 sugar beet crop were paid and unpaid labour, custom work and specialized labour, and hail/crop insurance, which amounted to approximately \$125 per acre (\$5.32 per tonne). Together these costs accounted for about 18 percent of total variable costs. Unpaid family and operator labour amounted to about \$25 per acre (\$1.04 per tonne).

Total variable costs for the study sample amounted to \$682 per acre (\$29 per tonne). Total variable costs for sugar beets grown on owned and rented land (Tables 3 and 4) were \$691 per acre (\$28.88 per tonne) and \$662 per acre (\$29.20 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 \$752 per acre or \$31.92 per tonne. Total cash costs for sugar beets grown on owned land (Tables 3) were \$728 (\$30.46 per tonne) compared with \$811 per acre (\$35.80 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 \$187 per acre (\$7.93 per tonne). This represents about 21 percent of total sugar beet production

costs in 2011. Capital costs were \$169 per acre (7.07 per tonne), approximately 20 percent of total costs of sugar beets produced on owned land (Table 3). Total capital costs for beets produced on rented land amounted to \$232 per acre (10.23 per tonne) or approximately 26 percent of total 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 2011 crop was \$164 per acre (\$7.23 per tonne) for the seven (7) fields used to grow sugar beets on rented land (Table 4). Land rent represents approximately 18 percent of total production costs for these producers.

Taxes, water rates and insurance for the study participants were estimated at about \$30 per acre or about \$1.29 per tonne. These were about \$39 per acre (\$1.64 per tonne) for beets grown on owned land and \$8 per acre (\$0.36 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 \$93 per acre (\$3.94 per tonne) for the study sample. For beets produced on owned land, depreciation costs as shown in Table 3 were \$107 per acre (\$4.49 per tonne) compared to about \$56 per acre (\$2.48 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 10 beet producers was estimated at \$869 per acre or \$36.90 per tonne (Table 2). Of this, 86 percent were direct cash costs, almost 11 percent depreciation costs and the remaining three (3) percent for unpaid operator labour. Figure 8 shows a graphical presentation of total production costs for the 2011 sugar beet study sample on a per acre basis. Total production costs for sugar beets grown on owned land (Tables 3) was estimated at \$860 or \$35.95 per tonne compared with \$894 per acre (\$39.43 per tonne) for beets produced on rented land.

## **Net Returns**

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 \$522 per acre or \$22.14 per tonne for the entire study sample (Table 2). It was \$563 per acre (\$23.55 per tonne) for beet produced on owned land (Table 3) and \$417 per acre (\$18.39 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 of 10 beet producers was positive at \$429 per acre or \$18.20 per tonne. Return to unpaid labour for beets grown on owned land was positive at \$456 per acre or \$19.06 per tonne (Table 3). Return to unpaid labour for beets grown on rented was also positive at \$361 per acre or \$15.92 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 \$421 per acre or \$17.88 per tonne (Table 2). It was positive at \$454 per acre (\$18.99 per tonne) for beets produced on owned land (Table 3). Return to investment was also positive at \$338 per acre (\$14.92 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 \$404 per acre or \$17.16 per tonne for the study sample (21 fields, Table 2). It was positive at \$432 per acre (\$18.06 per tonne) for beets produced on owned land (14 fields, Table 3). Return to equity was also positive at \$335 per acre or \$14.76 per tonne for beets produced on rented land (7 fields, Table 4).

**Table 2: Sugar Beet Production Costs and Returns, 2011 (21 Enterprises)**

Acres Cropped (acres)	90.1	
Yield Per Acre (tonne)	23.56	
	<b>\$ per acre</b>	<b>\$ per tonne</b>
<b>GROSS RETURNS</b>		
Crop Sales	1,260.91	53.52
Crop Insurance Receipts	9.87	
Miscellaneous Receipts	2.85	
<b>A. TOTAL GROSS RETURN</b>	<b>1,273.63</b>	<b>54.06</b>
<b>VARIABLE COSTS</b>		
Seed	130.62	
Fertilizer	93.18	
Chemicals	11.53	
Hail / Crop Insurance	25.63	
Association Fees & Research Levies	15.79	0.6701
Trucking & Marketing	88.88	
Machine Fuel (Net of Rebate)	67.35	
Irrigation Fuel	36.56	
Repairs - Machinery	54.19	
Repairs - Buildings	4.22	
Utilities, Insurance & Overhead	42.87	
Custom Work & Specialized Labour	36.51	
Operating Interest Paid	11.89	
Paid Labour & Benefits	38.77	
Unpaid Family and Operator Labour	24.5	1.04
<b>B. TOTAL VARIABLE COSTS</b>	<b>682.49</b>	<b>28.97</b>
<b>CAPITAL COSTS</b>		
Cash Rent /Crop Share	46.46	1.97
Taxes, Water Rates, Insurance	30.45	1.29
Equipment/Building Depreciation	92.92	3.94
Lease Payments	0.00	0.00
Paid Capital Interest	17.02	0.72
<b>C. TOTAL CAPITAL COSTS</b>	<b>186.85</b>	<b>7.93</b>
<b>D. TOTAL CASH COSTS (B+C - Unpaid Labour - Depreciation)</b>	<b>751.92</b>	<b>31.92</b>
<b>E. TOTAL PRODUCTION COSTS (B+C)</b>	<b>869.34</b>	<b>36.90</b>
<b>F. NET RETURNS</b>		
Gross Margin (A-D)	<b>521.71</b>	<b>22.14</b>
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	<b>428.79</b>	<b>18.20</b>
Return to Investment (A-E + Paid Capital Interest)	<b>421.31</b>	<b>17.88</b>
Return to Equity (A-E)	<b>404.29</b>	<b>17.16</b>
<b>INVESTMENT</b>		
Land & Buildings	3,945.79	
Machinery	925.27	

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

**Table 3: Sugar Beet Production Costs and Returns (Owned Land), 2011 (14 Enterprises)**

Acres Cropped (acres)	96.83	
Yield Per Acre (tonne)	23.91	
	<b>\$/Acre</b>	<b>\$ per tonne</b>
<b>GROSS RETURNS</b>		
Crop Sales	1,279.84	53.52
Crop Insurance Receipts	7.74	
Miscellaneous Receipts	3.97	
<b>A. TOTAL GROSS RETURN</b>	<b>1,291.55</b>	<b>54.01</b>
<b>VARIABLE COSTS</b>		
Seed	130.62	
Fertilizer	94.58	
Chemicals	12.17	
Hail / Crop Insurance	21.52	
Association Fees & Research Levies	15.85	
Trucking & Marketing	95.03	
Machine Fuel (Net of Rebate)	73.29	
Irrigation Fuel	39.67	
Repairs - Machinery	55.75	
Repairs - Buildings	5.28	
Utilities, Insurance & Overhead	37.44	
Custom Work & Specialized Labour	29.49	
Operating Interest Paid	15.08	
Paid Labour & Benefits	41.08	
Unpaid Family and Operator Labour	23.78	0.99
<b>B. TOTAL VARIABLE COSTS</b>	<b>690.63</b>	<b>28.88</b>
<b>CAPITAL COSTS</b>		
Cash Rent /Crop Share	0	
Taxes, Water Rates, Insurance	39.24	1.64
Equipment/Building Depreciation	107.47	4.49
Lease Payments	0	
Paid Capital Interest	22.27	
<b>C. TOTAL CAPITAL COSTS</b>	<b>168.98</b>	<b>7.07</b>
<b>D. TOTAL CASH COSTS (B+C - Unpaid Labour - Depreciation)</b>	<b>728.36</b>	<b>30.46</b>
<b>E. TOTAL PRODUCTION COSTS (B+C)</b>	<b>859.61</b>	<b>35.95</b>
<b>F. NET RETURNS</b>		
Gross Margin (A-D)	<b>563.19</b>	<b>23.55</b>
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	<b>455.72</b>	<b>19.06</b>
Return to Investment (A-E + Paid Capital Interest)	<b>454.21</b>	<b>18.99</b>
Return to Equity (A-E)	<b>431.94</b>	<b>18.06</b>
<b>INVESTMENT</b>		
Land & Buildings	5,444.35	
Machinery	1073.09	

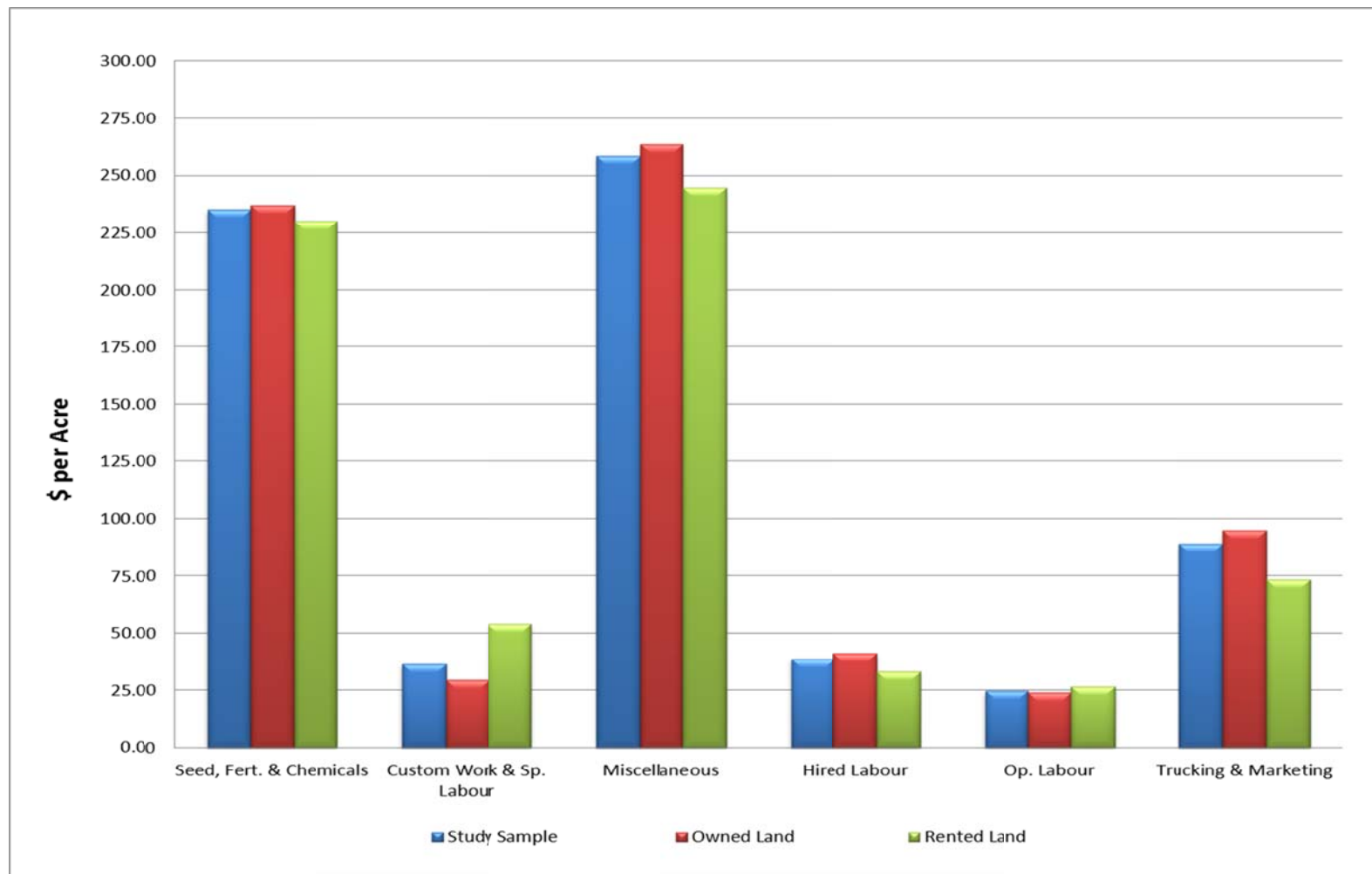
Source: Economics Branch, Alberta Agriculture and Rural Development, Edmonton, Alberta.

**Table 4: Sugar Beet Production Costs and Returns (Rented Land), 2011 (7 Enterprises)**

Acres Cropped (acres)	76.64	
Yield Per Acre (tonne)	22.67	
	<b>\$/Acre</b>	<b>\$ per tonne</b>
<b>GROSS RETURNS</b>		
Crop Sales	1,213.09	53.52
Crop Insurance Receipts	15.26	
Miscellaneous Receipts	0	
<b>A. TOTAL GROSS RETURN</b>	<b>1,228.35</b>	<b>54.19</b>
<b>VARIABLE COSTS</b>		
Seed	130.62	
Fertilizer	89.64	
Chemicals	9.92	
Hail / Crop Insurance	36.03	
Association Fees & Research Levies	15.64	
Trucking & Marketing	73.33	
Machine Fuel (Net of Rebate)	52.32	
Irrigation Fuel	28.7	
Repairs - Machinery	50.24	
Repairs - Buildings	1.53	
Utilities, Insurance & Overhead	56.58	
Custom Work & Specialized Labour	54.25	
Operating Interest Paid	3.84	
Paid Labour & Benefits	32.92	
Unpaid Family and Operator Labour	26.3	
<b>B. TOTAL VARIABLE COSTS</b>	<b>661.86</b>	<b>29.20</b>
<b>CAPITAL COSTS</b>		
Cash Rent /Crop Share	163.85	7.23
Taxes, Water Rates, Insurance	8.23	0.36
Equipment/Building Depreciation	56.15	2.48
Lease Payments	0	
Paid Capital Interest	3.76	
<b>C. TOTAL CAPITAL COSTS</b>	<b>231.99</b>	<b>10.23</b>
<b>D. TOTAL CASH COSTS (B+C - Unpaid Labour - Depreciation)</b>	<b>811.40</b>	<b>35.80</b>
<b>E. TOTAL PRODUCTION COSTS (B+C)</b>	<b>893.85</b>	<b>39.43</b>
<b>F. NET RETURNS</b>		
Gross Margin (A-D)	<b>416.95</b>	<b>18.39</b>
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	<b>360.80</b>	<b>15.92</b>
Return to Investment (A-E + Paid Capital Interest)	<b>338.26</b>	<b>14.92</b>
Return to Equity (A-E)	<b>334.50</b>	<b>14.76</b>
<b>INVESTMENT</b>		
Land & Buildings	159.29	
Machinery	551.79	

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

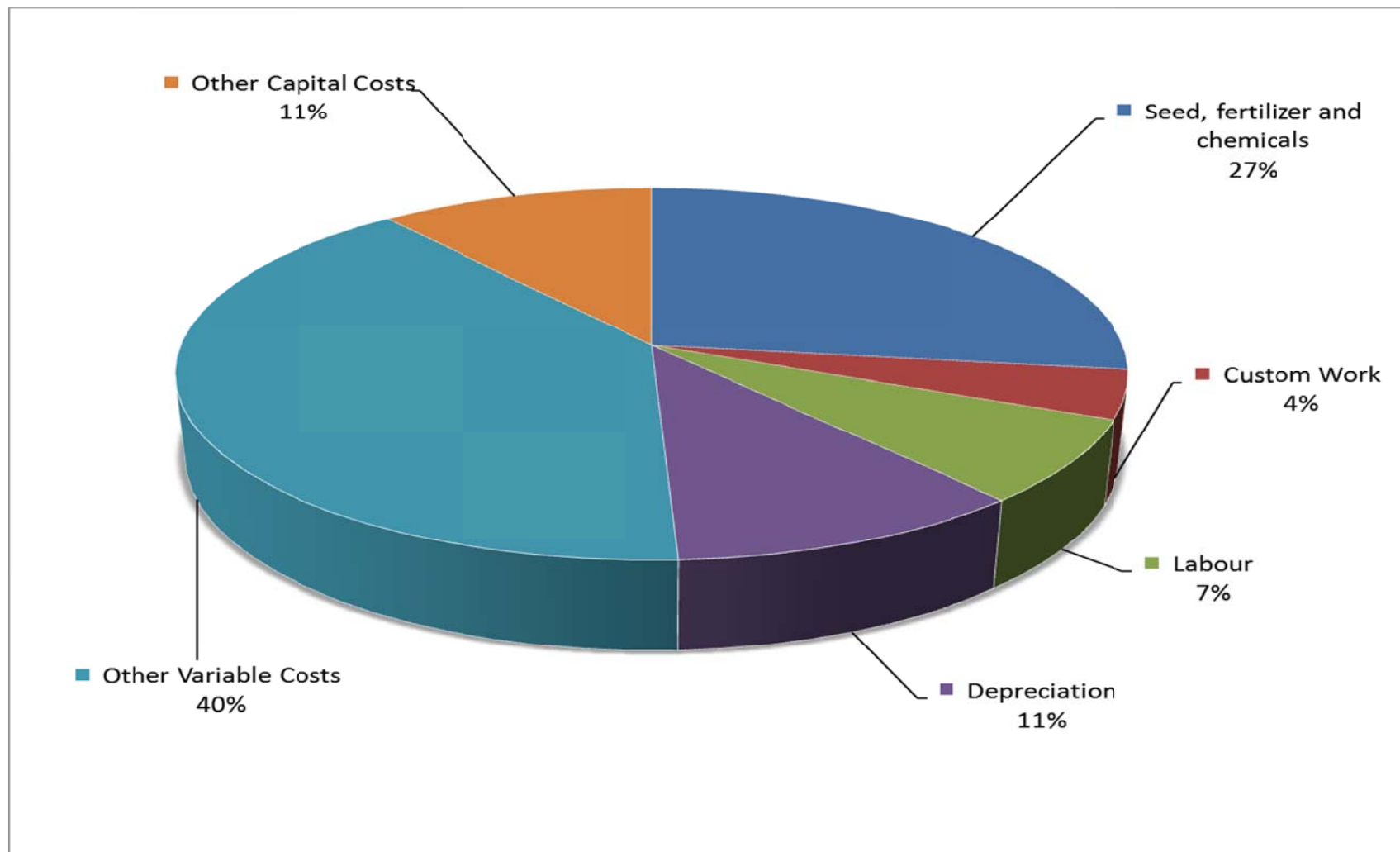
**Figure 7: Variable Costs Breakdown for Sugar Beets, 2011**



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



**Figure 8: Breakdown of Total Production Costs for Sugar Beet Production, 2011**



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

## SECTION V

### **SUGAR BEET PRODUCTION COSTS AND RETURNS BY SIZE OF OPERATION, 2011**

The study sample of ten beet producers (21 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 by size of fields: Group I (Up to 50 Acres), Group II (51 to 100 Acres), Group III (Over 100 Acres).

#### **Group I (Up to 50 Acres)**

Table 5 presents production costs and returns for sugar beet producers in Group I. The number of sugar beet fields in Group I was three (3) with an average size of 29.67 acres or about 5 percent of the area surveyed for the 2011 study. Average yield for this group of beet producers was 22.17 tonnes per acre, lower by about one tonne per acre compared to Group II (23.25 tonnes) and by about one and half tonnes per acre compared to Group III (23.86 tonnes).

Revenue from beet sales for Group I participants was \$1,186 per acre. When crop insurance and miscellaneous receipts were added to beet sales, gross return per acre increased to \$1,199 (\$54.08 per tonne). Average variable costs for this group were estimated at \$647 per acre (\$29.19 per tonne). Total cash costs for Group I participants was \$749 per acre or \$33.80 per tonne. Average capital costs were estimated at about \$230 per acre (\$10.35 per tonne). Total production costs for study participants in Group I amounted to \$877 per acre or \$39.54 per tonne, somewhat higher than both Group II and Group III.

The net returns for this Group were all positive. The gross margin was \$450 per acre (\$20.28 per tonne). Return to unpaid labour was \$348 per acre (\$15.69 per tonne). The return to investment was at \$377 per acre (\$16.99 per tonne) and return to equity was at \$322 per acre (\$14.53 per tonne). Detailed breakdown of gross returns, variable costs, capital costs, total production costs and net returns for Group I participants are presented in Table 5.

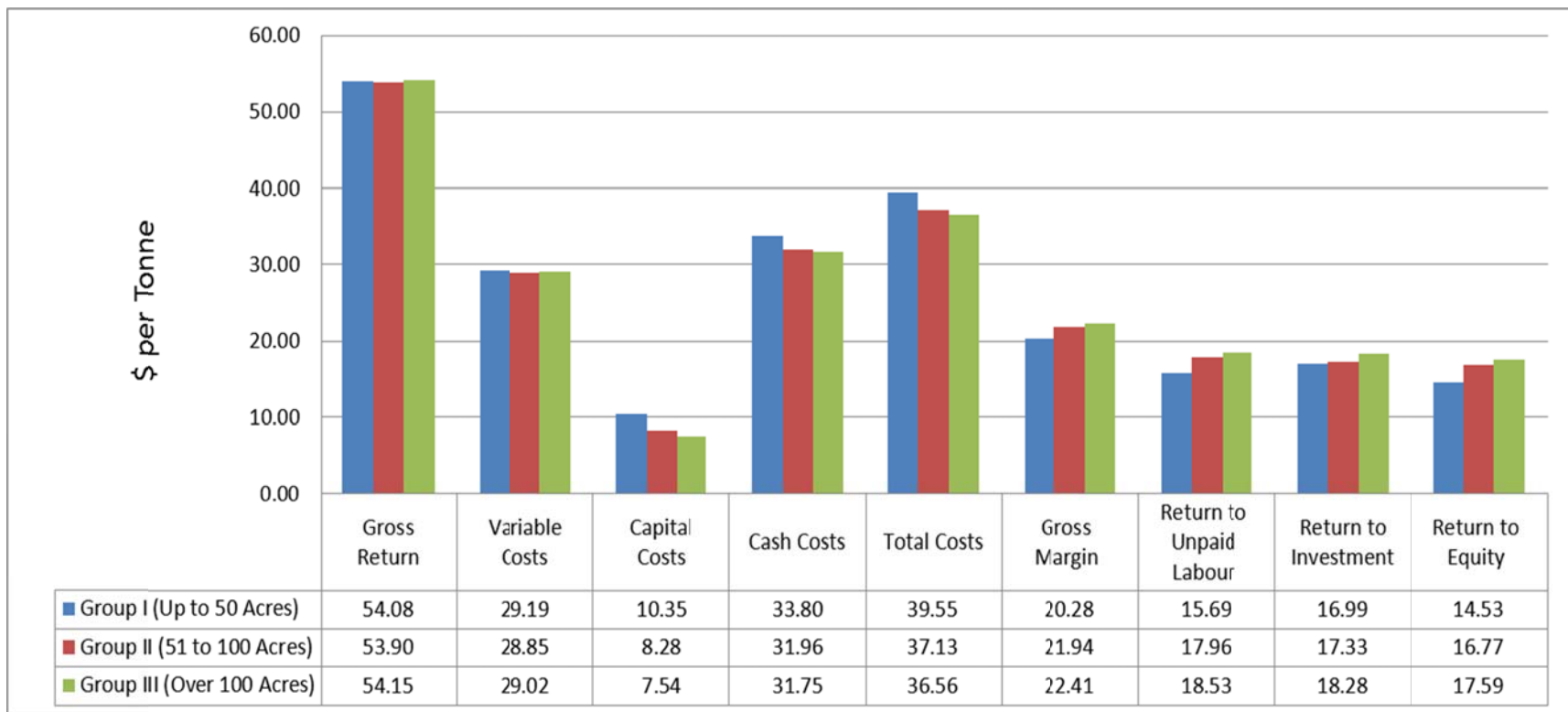
Comparison of the costs and returns by size of operation on a per acre and per tonne basis are presented in Figures 9 and 10 respectively.

**Table 5: Sugar Beet Production Costs and Returns (Up to 50 Acres), 2011 (3 Enterprises)**

Acres Cropped (acres)	29.67	
Yield Per Acre (tonne)	22.17	
	<b>\$ per acre</b>	<b>\$ per tonne</b>
<b>GROSS RETURNS</b>		
Crop Sales	1,186.42	53.52
Crop Insurance Receipts	12.4	
Miscellaneous Receipts	0	
<b>A. TOTAL GROSS RETURN</b>	<b>1,198.82</b>	<b>54.08</b>
<b>VARIABLE COSTS</b>		
Seed	130.62	
Fertilizer	92.54	
Chemicals	11.9	
Hail / Crop Insurance	10.49	
Association Fees & Research Levies	15.56	
Trucking & Marketing	97.47	
Machine Fuel (Net of Rebate)	92.99	
Irrigation Fuel	71.69	
Repairs - Machinery	47.95	
Repairs - Buildings	4.21	
Utilities, Insurance & Overhead	32.31	
Custom Work & Specialized Labour	0	
Operating Interest Paid	6.87	
Paid Labour & Benefits	6.99	
Unpaid Family and Operator Labour	25.54	1.15
<b>B. TOTAL VARIABLE COSTS</b>	<b>647.13</b>	<b>29.19</b>
<b>CAPITAL COSTS</b>		
Cash Rent /Crop Share	35.96	1.62
Taxes, Water Rates, Insurance	37.29	1.68
Equipment/Building Depreciation	101.84	4.59
Lease Payments	0.00	0.00
Paid Capital Interest	54.44	2.46
<b>C. TOTAL CAPITAL COSTS</b>	<b>229.53</b>	<b>10.35</b>
<b>D. TOTAL CASH COSTS (B+C - Unpaid Labour - Depreciation)</b>	<b>749.28</b>	<b>33.80</b>
<b>E. TOTAL PRODUCTION COSTS (B+C)</b>	<b>876.66</b>	<b>39.55</b>
<b>F. NET RETURNS</b>		
Gross Margin (A-D)	<b>449.54</b>	<b>20.28</b>
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	<b>347.70</b>	<b>15.69</b>
Return to Investment (A-E + Paid Capital Interest)	<b>376.60</b>	<b>16.99</b>
Return to Equity (A-E)	<b>322.16</b>	<b>14.53</b>
<b>INVESTMENT</b>		
Land & Buildings	3,548.47	
Machinery	1,053.54	

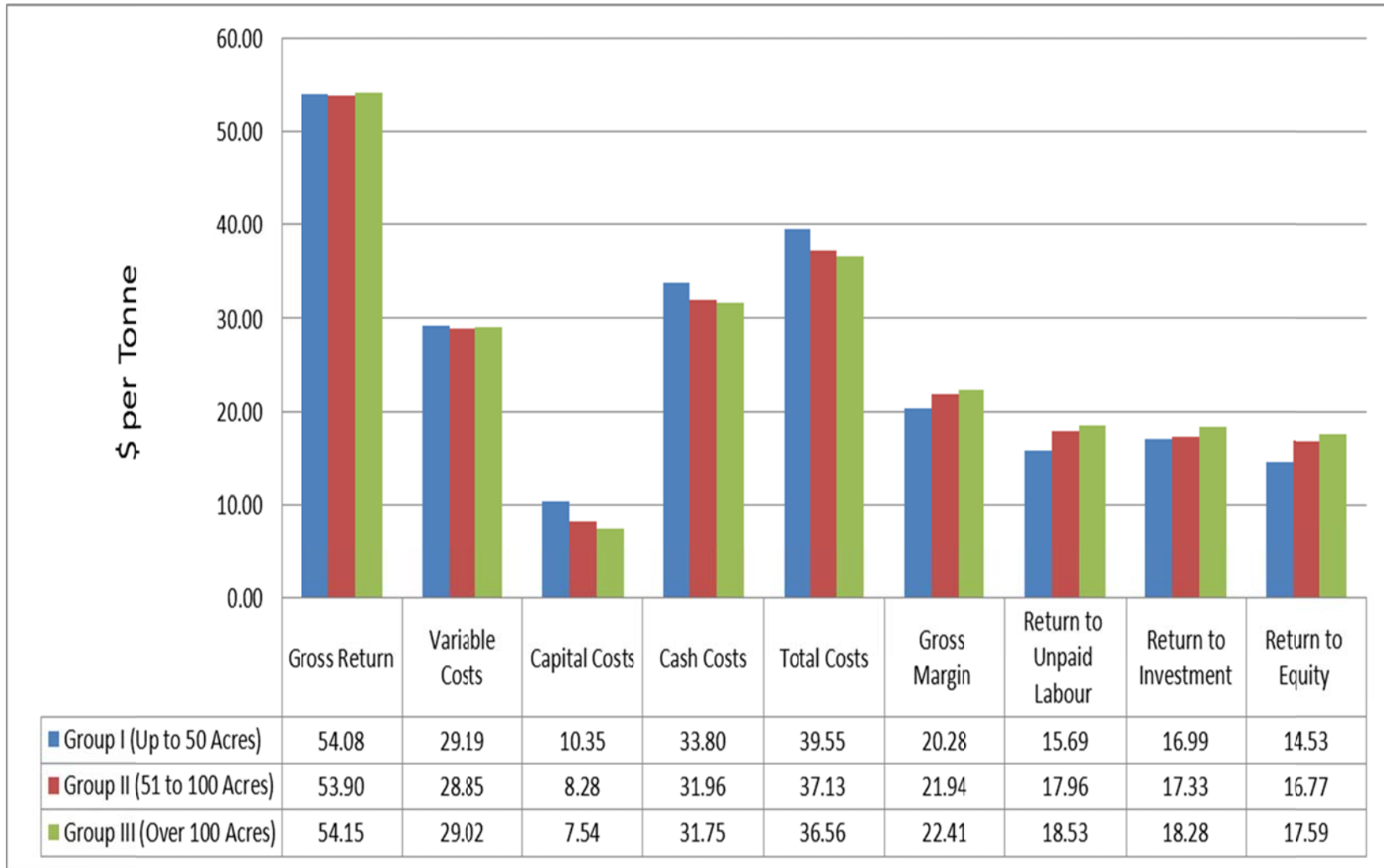
Source: Economics Branch, Alberta Agriculture and Rural Development, Edmonton, Alberta.

**Figure 9: Sugar Beet Costs and Returns by Size of Operation, 2011 (\$ 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 II (51 to 100 Acres)**

Results for Group II beet participants are presented in Table 6. There were 10 beet fields in the range of 50 to 100 acres with an average field size of 68.65 acres. This Group represented about 36 percent of the sugar beet area surveyed for the 2011 crop. Average yield per acre for this group was at 23.25 tonnes, higher by about one tonne per acre when compared with Group II and lower by about half tonne per acre compared to Group III. Average gross revenue for participants in Group II amounted to \$1,253 per acre or \$53.90 per tonne. Variable costs were estimated at \$671 per acre (\$28.85 per tonne). Capital costs for this group were estimated at \$193 per acre (\$8.28 per tonne). Average total production costs for these ten sugar beet fields were \$863 per acre or \$37.13 per tonne. Gross margin was positive at \$510 per acre (\$21.94 per tonne). Average net returns to unpaid labour and investment were positive at \$418 per acre (\$17.96 per tonne) and \$403 per acre (\$17.33 per tonne), respectively. Return to equity was also positive at \$390 per acre (\$16.77 per tonne). Detailed breakdown of costs and returns is presented in (Table 6). As shown in Figure 10, this group of beet producers (Group II) had somewhat higher net returns per tonne when compared with Group I (up to 50 acres) but lower than Group III (over 100 acres) study participants.

**Group III (Over 100 Acres)**

Average area per farm for Group III study participants (over 100 acres) was about 140 acres or 59 percent of the beet area surveyed for the 2011 crop. This group of beet producers had 8 beet fields in 2011. Average beet yield per acre for this group was 23.86 tonnes per acre. Gross revenue for Group III beet producers was \$1,292 per acre (\$54.15 per tonne). Variable costs were estimated at \$692 per acre or \$29.02 per tonne. Capital costs for this group amounted to \$180 per acre (\$7.54 per tonne). Total production costs for these participants were estimated at \$872 per acre (\$36.56 per tonne). The estimated gross margin was positive for this Group of participants at \$535 per acre (\$22.41 per tonne). Net returns to unpaid labour, investment and equity were all positive and significantly higher for this Group of study participants. Detailed breakdown on gross revenue, variable and capital costs and net returns are presented in Table 7.

**Table 6: Sugar Beet Production Costs and Returns (51 to 100 Acres), 2011 (10 Enterprises)**

Acres Cropped (acres)	68.65	
Yield Per Acre (tonne)	23.25	
	<b>\$ per acre</b>	<b>\$ per tonne</b>
<b>GROSS RETURNS</b>		
Crop Sales	1,244.36	53.52
Crop Insurance Receipts	6.38	
Miscellaneous Receipts	2.57	
<b>A. TOTAL GROSS RETURN</b>	<b>1,253.31</b>	<b>53.90</b>
<b>VARIABLE COSTS</b>		
Seed	130.62	
Fertilizer	86.37	
Chemicals	10.03	
Hail / Crop Insurance	23.02	
Association Fees & Research Levies	15.74	
Trucking & Marketing	69.68	
Machine Fuel (Net of Rebate)	83.86	
Irrigation Fuel	35.21	
Repairs - Machinery	63.95	
Repairs - Buildings	4.9	
Utilities, Insurance & Overhead	53.47	
Custom Work & Specialized Labour	30.36	
Operating Interest Paid	1.76	
Paid Labour & Benefits	34.05	
Unpaid Family and Operator Labour	27.74	1.19
<b>B. TOTAL VARIABLE COSTS</b>	<b>670.76</b>	<b>28.85</b>
<b>CAPITAL COSTS</b>		
Cash Rent /Crop Share	60.17	2.59
Taxes, Water Rates, Insurance	26.89	1.16
Equipment/Building Depreciation	92.49	3.98
Lease Payments	0.00	0.00
Paid Capital Interest	13.07	0.56
<b>C. TOTAL CAPITAL COSTS</b>	<b>192.62</b>	<b>8.28</b>
<b>D. CASH COSTS (B+C - Unpaid Labour - Depreciation)</b>	<b>743.15</b>	<b>31.96</b>
<b>E. TOTAL PRODUCTION COSTS (B+C)</b>	<b>863.38</b>	<b>37.13</b>
<b>F. NET RETURNS</b>		
Gross Margin (A-D)	<b>510.16</b>	<b>21.94</b>
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	<b>417.67</b>	<b>17.96</b>
Return to Investment (A-E + Paid Capital Interest)	<b>403.00</b>	<b>17.33</b>
Return to Equity (A-E)	<b>389.93</b>	<b>16.77</b>
<b>INVESTMENT</b>		
Land & Buildings	3,435.13	
Machinery	940.34	

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

**Table 7: Sugar Beet Production Costs and Returns (Over 100 Acres), 2011 (8 Enterprises)**

Acres Cropped (acres)	139.57	
Yield Per Acre (tonne)	23.86	
	<b>\$ per acre</b>	<b>\$ per tonne</b>
<b>GROSS RETURNS</b>		
Crop Sales	1,277.03	53.52
Crop Insurance Receipts	11.81	
Miscellaneous Receipts	3.24	
<b>A. TOTAL GROSS RETURN</b>	<b>1,292.08</b>	<b>54.15</b>
<b>VARIABLE COSTS</b>		
Seed	130.62	
Fertilizer	97.42	
Chemicals	12.42	
Hail / Crop Insurance	28.45	
Association Fees & Research Levies	15.84	
Trucking & Marketing	99.99	
Machine Fuel (Net of Rebate)	55.15	
Irrigation Fuel	34.58	
Repairs - Machinery	48.68	
Repairs - Buildings	3.8	
Utilities, Insurance & Overhead	37.19	
Custom Work & Specialized Labour	43.2	
Operating Interest Paid	18.53	
Paid Labour & Benefits	44.2	
Unpaid Family and Operator Labour	22.42	0.94
<b>B. TOTAL VARIABLE COSTS</b>	<b>692.49</b>	<b>29.02</b>
<b>CAPITAL COSTS</b>		
Cash Rent /Crop Share	38.86	1.63
Taxes, Water Rates, Insurance	32.09	1.34
Equipment/Building Depreciation	92.47	3.88
Lease Payments	0.00	0.00
Paid Capital Interest	16.47	0.69
<b>C. TOTAL CAPITAL COSTS</b>	<b>179.89</b>	<b>7.54</b>
<b>D. CASH COSTS (B+C - Unpaid Labour - Depreciation)</b>	<b>757.49</b>	<b>31.75</b>
<b>E. TOTAL PRODUCTION COSTS (B+C)</b>	<b>872.38</b>	<b>36.56</b>
<b>F. NET RETURNS</b>		
Gross Margin (A-D)	<b>534.59</b>	<b>22.41</b>
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	<b>442.12</b>	<b>18.53</b>
Return to Investment (A-E + Paid Capital Interest)	<b>436.17</b>	<b>18.28</b>
Return to Equity (A-E)	<b>419.70</b>	<b>17.59</b>
<b>INVESTMENT</b>		
Land & Buildings	4,291.41	
Machinery	905.79	

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. The 2011 study sample of 10 beet growers (21 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 8 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 2011, was higher for the large 1/3 group (25.33 tonnes) compared with the small 1/3 group (21.45 tonnes). Cash costs for the large 1/3 group of producers was \$877 per acre compared with \$651 for the small 1/3 group. Total costs for the large 1/3 group of producers was \$990 per acre compared with \$745 for the small 1/3 group. Gross margin for the large 1/3 group was \$635 per acre compared with \$337 per acre for the small 1/3 group. Return to equity for the large 1/3 group was \$530 per acre compared to \$229 per acre for the bottom 1/3 (small) group.

Higher management rating is associated with the high gross margin and return to equity for the large 1/3 group relative to the small 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 8: Profile of Management Factors for Sugar Beet Production, 2011**

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 Managt.
									Land	Buildings	Machine	Irrigation	
Acres	140.94	24.03	43.25	25.29	759.58	864.10	543.09	438.57	3,738.00	152.08	545.42	260.05	2.21
	47.50	22.14	20.28	25.40	830.86	940.51	373.86	264.20	2,017.86	233.83	681.67	121.38	1.36
Yield	106.66	25.33	38.43	34.76	750.02	893.90	611.66	467.79	3,000.00	215.80	720.27	407.14	2.57
(Tonne/Acre)	74.93	21.45	22.79	19.11	781.88	852.99	398.98	327.88	2,309.43	63.71	527.55	12.00	1.43
Special Custom	105.23	24.36	71.06	27.89	819.19	937.46	493.44	375.18	3,017.86	502.50	687.80	67.33	2.04
(\$/Acre)	63.50	21.95	0.00	23.19	766.91	866.26	437.26	337.91	2,380.86	55.27	703.77	101.34	1.61
Unpaid Labour	80.37	23.90	39.28	37.49	776.34	919.33	509.05	366.05	3,589.29	326.38	686.19	349.84	2.07
(\$/Acre)	92.36	22.52	17.00	10.53	760.85	854.60	475.09	381.34	4,380.86	192.11	712.40	101.34	1.82
Cash costs	76.30	23.44	54.01	26.39	876.59	969.87	406.83	313.55	2,303.57	327.91	496.63	67.33	1.50
(\$/Acre)	82.00	23.02	20.85	23.89	650.64	761.17	582.41	471.88	4,321.43	96.11	633.38	326.31	2.57
Total Costs	84.93	22.79	46.24	21.63	872.05	990.31	369.92	251.66	2,303.57	408.96	733.41	121.38	1.39
(\$/Acre)	93.00	22.72	17.15	18.94	654.47	745.41	572.23	481.29	4,702.29	75.38	591.40	197.05	2.43
Gross Margin	103.66	24.96	32.76	27.96	707.87	838.90	634.84	503.81	4,535.71	189.09	624.52	450.93	2.71
(\$/Acre)	60.36	21.79	38.13	25.97	851.30	943.98	337.16	244.47	1,303.57	249.78	578.57	32.04	1.21
Return to Equity	103.80	24.61	39.92	22.16	715.28	794.99	609.37	529.66	4,000.00	155.04	528.82	35.29	2.57
(\$/Acre)	74.93	22.07	45.28	22.63	864.98	974.63	338.76	229.12	1,589.29	401.62	733.47	32.04	1.21
Land Investment	113.66	23.41	41.89	16.76	735.06	850.80	532.09	416.35	6,148.71	403.92	668.75	246.56	2.18
(\$/Acre)	76.64	22.50	36.33	24.25	817.92	902.86	408.61	323.67	0.00	131.85	612.71	0.00	1.54
Buildings Investment	94.23	24.00	67.48	27.89	825.00	943.27	468.29	350.02	3,017.86	502.50	687.80	67.33	1.89
(\$/Acre)	87.36	22.23	9.86	14.87	745.91	814.09	474.74	406.57	3,380.86	32.92	557.56	12.00	1.82
Machine Investment	79.00	22.71	14.55	32.56	715.09	875.69	500.49	339.89	3,142.86	250.10	961.99	371.85	2.07
(\$/Acre)	93.66	23.67	59.59	20.65	809.72	884.72	477.19	402.19	4,446.43	294.73	372.18	67.33	1.93
Irrigation Investment	84.71	24.29	33.26	34.51	755.19	929.89	547.70	373.00	4,767.86	321.70	724.61	696.10	2.32
(\$/Acre)	102.36	22.62	42.71	13.14	790.64	870.35	443.50	363.79	2,857.14	229.28	626.23	0.00	1.75
Overall Management*	105.86	24.02	20.59	29.69	674.74	821.66	611.23	464.31	3,964.29	130.16	729.08	556.90	3.00
(\$/Acre)	60.36	21.79	38.13	25.97	851.30	943.98	337.16	244.47	1,303.57	249.78	578.57	32.04	1.00
Weighted Average(\$/Ac.)	90.10	23.56	36.51	24.50	751.91	869.32	521.72	404.31	3,705.60	240.19	678.22	247.05	2.00

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

## **SECTION VI**

### **COMPARISON OF COSTS AND RETURNS, 2001-2011**

Table 9 presents eleven years comparison (2001 to 2011) 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 9 or Figure 11, gross returns over the period ranged from \$636 per acre in 2002 to \$1,274 per acre in 2011. Average gross revenue for the 2011 beet study participants was estimated at \$1,274 per acre compared to \$1,172 per acre for the 2010 beet crop, an increase of approximately 9 percent. This increase in returns is primarily due to an increase in both yield and price received for the beet crop (i.e. approximately 22 percent and 0.8 percent respectively). The average yield reported by the study participants in 2011 was 23.56 tonnes per acre compared to 19.24 tonnes per acre in 2010. Similarly the average price reported by the study participants in 2011 was \$53.52 per tonnes compared to \$53.12 per tonne in 2010.

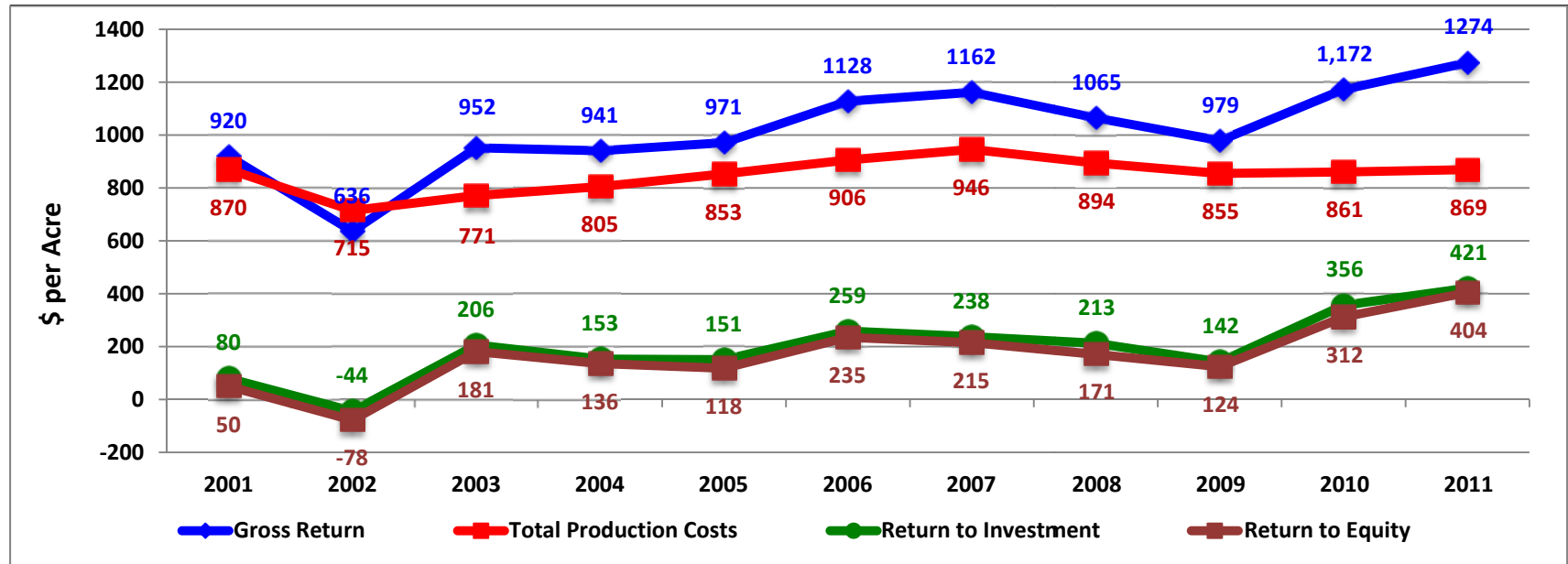
Total production costs over the period (2001 to 2011) ranged from \$715 in 2002 to \$946 per acre in 2007. The average total production costs for 2011 beet study participants increased marginally by about 1 percent compared to 2010. Total variable costs per acre for the study participants in 2011 increased by 11 percent compared to 2010 however this is offset by a significant decrease in total capital costs per acre of about 23 percent (i.e. from \$244 per acre in 2010 to \$187 per acre in 2011).

As shown on Table 9 or Figure 11, net returns per acre (i.e. returns to unpaid labour, investment and equity) have varied considerably during the last eleven years (i.e. from 2001 to 2011). Average returns to unpaid labour ranged from negative \$18 per acre in 2002 to \$429 per acre in 2011. Average return to investment per acre ranged from negative \$44 per acre in 2002 to \$421 per acre in 2011. Return to equity ranged from negative \$78 per acre in 2002 to \$404 per acre in 2011. In comparison to 2010, the higher net return per acre realized in 2011 was due to the high increase in gross return.

**Table 9: Comparison of Costs and Returns for Sugar Beet Production, 2001-2011 (\$ per acre)**

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

**Figure 11: Comparison of Costs and Returns for Sugar Beet Production, 2001-2011 (\$ per acre)**



## SECTION VII

### SUMMARY

A summary of the 2011 sugar beets production costs and returns is presented in Table 10. As mentioned earlier, the sample size of ten (10) sugar beet producers (21 fields) for the 2011 beets crop was divided into two groups, i.e., beets produced on owned (14 fields) and rented land (7 fields). The sample size of beet producers in 2011 is the smallest sample size in the history of the cost of production study since its inception in the early sixties.

As shown in Table 10, average gross returns based on crop sales, miscellaneous receipts and government program payment amounted to \$1,274 per acre (\$54.06 per tonne) for the 2011 sugar beet crop. For beets produced on owned and rented land, gross returns were \$1,292 per acre (\$54.01 per tonne) and \$1,228 per acre (\$54.19 per tonne), respectively.

Average seed, fertilizer and chemical costs for sugar beet production in 2011 were estimated at \$235 per acre (\$9.99 per tonne) for the study sample. These costs were \$237 per acre (\$9.93 per tonne) for beets grown on owned land compared to \$214 per acre (\$9.44 per tonne) for rented land.

Miscellaneous costs (hail/crop insurance, utilities, other insurance, association fees and research levies) amounted to \$84 per acre (\$3.58 per tonne) for the study sample; \$75 per acre (\$3.13 per tonne) for beets produced on owned land and \$108 per acre (\$4.78 per tonne) for beets produced on rented land.

Fuel and repairs (machinery and building) amounted to \$162 per acre (\$6.89 per tonne) for the study sample in 2011. For beets grown on owned land, fuel and repairs were estimated at \$174 per acre (\$7.28 per tonne) compared to \$133 per acre (\$5.86 per tonne) for beets produced on rented land.

Trucking and marketing costs were calculated at \$89 per acre (\$3.77 per tonne) for the study sample, \$95 per acre (\$3.97 per tonne) for beets grown on owned land and \$88 per acre (\$3.86 per tonne) for beets grown on rented land.

Average cost for custom work and specialized labour amounted to \$37 per acre (\$1.55 per tonne) for the study sample, \$29 per acre (\$1.23 per tonne) for owned land and \$54 per acre (\$2.39 per tonne) for beets produced on rented land.

Average operating interest paid per acre was \$12 per acre (\$0.50 per tonne), \$15 per acre (\$0.63 per tonne), and \$4 per acre (\$0.17 per tonne) for the study sample, owned land and rented land groups, respectively.

Average labour cost (paid and unpaid) was \$63 per acre (\$2.69 per tonne) for the study sample. It was \$66 per acre (\$2.76 per tonne) for beets grown on owned land and \$65 per acre (\$2.86 per tonne) for rented land.

Average total variable cost for the 2011 sugar beet crop was estimated at \$682 per acre (\$28.97 per tonne) for the study sample; \$692 per acre (\$28.93 per tonne) for the owned land group and \$665 per acre (\$29.35 per tonne) for beets produced on rented land.

Average capital costs were estimated at \$187 per acre (\$7.93 per tonne) for all of the study participants. These were \$169 per acre (\$7.07 per tonne) for the group who produced beets on owned land and \$232 per acre (\$10.23 per tonne) for beets grown on rented land.

Average total production costs for the 2011 sugar beet crop (variable costs + capital costs) amounted to \$869 per acre (\$36.90 per tonne) for the study sample. For beets grown on owned and rented land, average total production costs per acre were at \$860 per acre (\$35.95 per tonne) and \$894 per acre (\$39.43 per tonne).

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 10.

The net returns for the study sample were all positive. Average gross margin was estimated at \$522 per acre (\$22.14 per tonne). Similarly, average return to unpaid labour was positive at \$429 per acre (\$18.20 per tonne) and returns to investment and equity were estimated at \$421 per acre (\$17.88 per tonne) and \$404 per acre (\$17.16 per tonne), respectively.

Average gross margin for beets grown on owned land was \$563 per acre or \$23.55 per tonne. Return to unpaid labour was estimated at \$456 per acre (\$19.06 per tonne). Returns to investment and equity were \$454 per acre (\$18.99 per tonne) and \$432 per acre (\$18.06 per tonne) respectively.

Average gross margin for beets grown on rented land was \$417 per acre (\$18.39 per tonne). Return to unpaid labour was \$361 per acre (\$15.92 per tonne). Return to investment was \$338 per acre (\$14.92 per tonne) and return to equity was \$334 per acre (\$14.76 per tonne).

**Table 10: Summary of Sugar Beet Production Costs and Returns, 2011**

	<b>Study Sample</b>		<b>Owned Land</b>		<b>Rented Land</b>	
Enterprises	21		14		7	
Acreage Cropped (acres)	90.10		96.83		76.64	
Yield Per Acre (tonnes)	23.56		23.91		22.67	
	<b>\$ per acre</b>	<b>\$ per tonne</b>	<b>\$ per acre</b>	<b>\$ per tonne</b>	<b>\$ per acre</b>	<b>\$ per tonne</b>
<b>GROSS RETURNS</b>	1,274	54.06	1,292	54.01	1,228	54.19
<b>VARIABLE COSTS</b>						
Input Costs (Seed, Fert. & Chem)	235	9.99	237	9.93	214	9.44
Miscellaneous	84	3.58	75	3.13	108	4.78
Fuel and Repairs (Mach. & Bldg.)	162	6.89	174	7.28	133	5.86
Custom Work & Specialized Labour	37	1.55	29	1.23	54	2.39
Labour (Paid & Unpaid)	63	2.69	66	2.76	65	2.86
Operating Interest	12	0.50	15	0.63	4	0.17
Trucking & Marketing	89	3.77	95	3.97	88	3.86
<b>B. TOTAL VARIABLE COSTS</b>	<b>682</b>	<b>28.97</b>	<b>692</b>	<b>28.93</b>	<b>665</b>	<b>29.35</b>
<b>C. TOTAL CAPITAL COSTS</b>	<b>187</b>	<b>7.93</b>	<b>169</b>	<b>7.07</b>	<b>232</b>	<b>10.23</b>
<b>D. TOTAL CASH COSTS (B+C - Unpaid Labour - Depreciation)</b>	<b>752</b>	<b>31.92</b>	<b>728</b>	<b>30.46</b>	<b>811</b>	<b>35.80</b>
<b>E. TOTAL PRODUCTION COSTS (B+C)</b>	<b>869</b>	<b>36.90</b>	<b>860</b>	<b>35.95</b>	<b>894</b>	<b>39.43</b>
<b>F. NET RETURNS</b>						
Gross Margin (A-D)	522	22.14	563	23.55	417	18.39
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	429	18.20	456	19.06	361	15.92
Return to Investment (A-E + Paid Capital Interest)	421	17.88	454	18.99	338	14.92
Return to Equity (A-E)	404	17.16	432	18.06	334	14.76

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



## **APPENDIX**

### **SUGAR BEET PRODUCTION COSTS AND RETURNS USING PROVINCIAL YIELD, 2011**

Sugar beet production costs and returns data presented in Table 11 are based on a provincial average yield of 23.55 tonnes in 2011. As mentioned at the beginning of the report, average yield for the study sample of ten beet producers was estimated at 23.56 tonnes per acre. This average yield of 23.56 tonnes was higher by 0.01 tonnes compared to the provincial average of 23.55 tonnes.

Assuming other receipts (crop insurance and miscellaneous) were the same for sugar beet growers for the 2011 beet crop, total gross revenue was calculated to be \$1,274 per acre or (\$54.06 per tonne). Variable and capital costs presented in Table 11 were also assumed to be the same as for the study sample. The purpose of including this data (Table 11) 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.

Given that the provincial yield was almost the same as the yield for the study sample of ten beet producers, the results were not impacted. Average gross margin was the same at \$522 per acre (\$22.14 per tonne). Similarly, return to unpaid labour, return to investment and equity were also the same with the provincial yield compared with the study sample. Details on gross revenue, costs and net returns for the 2011 beet crop using the provincial average yield of 23.55 tonnes per acre are presented in Table 11.

**Table 11: Sugar Beet Production Costs and Returns Based on Provincial Yield, 2011**

Acres Cropped (acres)	90.1	
Yield Per Acre (tonne)	23.55	
	<b>\$ per acre</b>	<b>\$ per tonne</b>
<b>GROSS RETURNS</b>		
Crop Sales	1,260.91	53.12
Crop Insurance Receipts	9.87	
Miscellaneous Receipts	2.85	
<b>A. TOTAL GROSS RETURN</b>	<b>1,273.63</b>	<b>54.08</b>
<b>VARIABLE COSTS</b>		
Seed	130.62	
Fertilizer	93.18	
Chemicals	11.53	
Hail / Crop Insurance	25.63	
Association Fees & Research Levies	15.79	
Trucking & Marketing	88.88	
Machine Fuel (Net of Rebate)	67.35	
Irrigation Fuel	36.56	
Repairs - Machinery	54.19	
Repairs - Buildings	4.22	
Utilities, Insurance & Overhead	42.87	
Custom Work & Specialized Labour	36.51	
Operating Interest Paid	11.89	
Paid Labour & Benefits	38.77	
Unpaid Family and Operator Labour	24.50	1.04
<b>B. TOTAL VARIABLE COSTS</b>	<b>682.49</b>	<b>28.98</b>
<b>CAPITAL COSTS</b>		
Cash Rent /Crop Share	46.46	1.97
Taxes, Water Rates, Insurance	30.45	1.29
Equipment/Building Depreciation	92.92	3.95
Lease Payments	0	0.00
Paid Capital Interest	17.02	0.72
<b>C. TOTAL CAPITAL COSTS</b>	<b>186.85</b>	<b>7.93</b>
<b>D. TOTAL CASH COSTS (B+C - Unpaid Labour - Depreciation)</b>	<b>751.92</b>	<b>31.93</b>
<b>E. TOTAL PRODUCTION COSTS (B+C)</b>	<b>869.34</b>	<b>36.91</b>
<b>F. NET RETURNS</b>		
Gross Margin (A-D)	<b>521.71</b>	<b>22.15</b>
Return to Unpaid Labour (A-E + Unpaid Operator Labour)	<b>428.79</b>	<b>18.21</b>
Return to Investment (A-E + Paid Capital Interest)	<b>421.31</b>	<b>17.89</b>
Return to Equity (A-E)	<b>404.29</b>	<b>17.17</b>
<b>INVESTMENT</b>		
Land & Buildings	3,945.79	
Machinery	925.27	

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