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The Economics
of Sugar Beet Production
in Alberta 2007



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THE ECONOMICS OF
SUGAR BEET PRODUCTION
IN ALBERTA
2007

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G. Nabi Chaudhary

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SECTION I

INTRODUCTION

Sugar beets grow 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. Sugar beet seeding begins in early spring and continues from mid-April to the end of May. Sugar beets are land and labour intensive and grown with supplementary irrigation. Because of drought and anticipated shortage of water for irrigation purpose, sugar beet production in Alberta decreased during 2001 to 2003. Area contracted for beet production decreased by almost 36 percent from 1999 to 2003, i.e. from 45,000 acres to 28,800 acres. However in 2004, area contracted for sugar beet production rebounded back and increased by 23 percent to over 35,000 acres in 2004. Increase in area for sugar beet production was the result of new agreement with the sugar factory and improved production conditions, e.g., water availability. In 2005, area contracted for beet production decreased by three percent to 34,300 acres. Similarly area seeded and harvested also decreased by three and four percent, respectively to 34,100 and 33,500 acres. In 2006, area contracted for beets rebounded to just over 37,000 acres, thus increasing by about eight (8) percent, even in 2005. In 2007, area contracted for beet production in Alberta decreased by about eight (8) percent to 34,138 acres, close to area contracted in 2005. However, in 2008, area contracted for beet production decreased by over forty seven (47) percent to 18,400 acres; the lowest ever in sugar beet production history.

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 1960's. 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 1970's. The 2007 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.

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 2007 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 30 producers were selected to be surveyed personally to obtain detailed cost and return information. However, due to time constraints and scheduling only seventeen (17) sugar beet producers could be surveyed for the 2007 crop. This represents less than ten (10) percent of the beet producers who signed contracts to produce beets in 2007. These seventeen (17) beet producers provided data on forty-four (44) fields (owned and rented) as each field was recorded separately. The forty-four (44) fields represent over twelve percent of the total area planted to sugar beets in 2007.

SECTION II

METHOD OF ANALYSIS

The raw data obtained from the seventeen (17) sugar beet producers with forty-four (44) fields were reviewed for any information gaps before entering into 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 few 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 basis¹. These results were used to allocate

¹ Prior to 1990 repair costs to sugar beet equipment were allocated 100 % 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 must be 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

SUGAR BEET PRODUCTION IN ALBERTA, 1980-2008

During the last twenty six years, contracted area under sugar beets in Alberta has fluctuated considerably. As a result of contractual difficulties there were no sugar beets grown in 1985. Table 1 presents an historical account of sugar beet production in Alberta from 1980 to 2008.

During the last twenty eight years, contracted area for sugar beet production has ranged from a low of 18,400 acres in 2008 to almost 46,000 acres in 1999. In 1997, area contracted for sugar beets was 33,467 acres, about 1.7 percent lower than in 1996. However, in 1998 contracted area for sugar beet production increased by almost 25 percent over in 1997 to 41,742 acres due to the expansion of the sugar factory. In 2000, contracted area for sugar beets decreased by about five (5) percent as several growers took leave from producing beets. Again in 2001, contracted area for sugar beets decreased drastically by 29 percent to 30,501 acres from 42,864 acres in 2000. A large number of beet producers again took leave from producing beets in 2001 due to anticipated water shortage and price concerns.

In 1999, area contracted for sugar beet production increased by about eight (8) percent to 45,965 acres over in 1998. In 1997, almost all of the planted acres were harvested compared to 97 percent of the crop harvested in 1992. Like the previous three years beet crops (1994, 1995 and 1996), over 99 percent of the planted acres were harvested in 1997 as well. In 1998, sugar beet area harvested was 98.5 percent of the area contracted, a very small decrease compared to the previous year. Similar to the previous year, sugar beet area harvested was 98.6 percent of the area contracted in 1999 at 44,387 acres. In 1999, area harvested was almost 23 percent higher than in 1998. However, the area harvested in 2000 decreased by five percent from the previous year. It further decreased by about 32 percent in 2001, which was primarily due to a decrease in area contracted and planted to beets. 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 was at the lowest level decreasing to 28,800 acres. However, sugar beet area contracted for the 2004 sugar beet crop

increased by almost 23 percent over the previous year. For the 2005 beet crop, area contracted for beet production decreased by three percent over the previous year to 34,302 acres. In 2006, area contracted for beets increased by about eight (8) percent to 37,204 acres over 2005 area. But area planted only increased by 1.5 percent acres (528 acres) and area harvested by only 98 acres. Area contracted for beet production in 2007 decreased back to the level of 2005 due to record tonnage production in 2006.

Sugar beet tonnage during the last 28 years, i.e., from 1980 to 2008, has ranged from a low of 385 199 tonnes in 2008 to 963 165 tonnes in 2006. Fluctuation in sugar beet tonnage has been the direct results of acres harvested and yield per acre. For the 2006 sugar beets crop, tonnage harvested was at 963 165, the highest during the last 27 years. The sudden increase in sugar beet tonnage in 2006 was the result of record yield of just over 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 area contracted and harvested, almost half of area used for producing beets in an average year.

The 1998 sugar beet production recorded the third highest yield of 23.32 tonnes. With increase in acres harvested and record yield, overall sugar beet production increased by more than 308 880 tonnes, an increase of 47.5 percent over in 1997. In 1999, although area harvested for beets had increased by eight (8) percent yet the overall production decreased by 12.5 percent to 839 700 tonnes from 1998. Average yield for the 1999 beet crop was estimated at 18.92 tonnes per acre, a decrease of almost 19 percent from the record yield in 1998. For the 2000 sugar beet crop, although area harvested was down by about five (5) percent, yet the tonnage of beets harvested was up by almost ten percent, i.e. from 839 700 tonnes in 1999 to 920 000 tonnes in 2000. In 2001, beet harvested tonnage was down by almost 43 percent, which was the direct result of 29 percent decrease in acres contracted and 16 percent decrease in yield per acre. For the 2003 sugar beet crop, area contracted (28,807 acres) and planted (28,700) were at the lowest levels during the last fourteen years. Acres harvested for beet were 27,388 which is a record low since 1980. In 2002 low acreage combined with the lowest yield at 15.22 tonnes per acre also resulted in lowest tonnage harvested in 2002. As mentioned above, sugar beet area contracted, planted and harvested

further declined by over four percent in 2003. However, tonnage harvested in 2003 increased by 49 percent primarily due to increase in beet yield of 51 percent over in 2002. Sugar beet area harvested in 2004 increased by about 28 percent over the previous year (2003) but overall tonnage only increased by 18 percent to 740 508 tonnes. Yield per acre for the 2004 beet crop decreased by about eight percent from the 2003 yield.

Average yield for the seventeen (17) sugar beets study participants was 26.19 tonnes per acre in 2007 compared with 25.06 tonnes per acre for the industry. Average yield for the 2006 beets crop surpassed all previous records and was 31 percent higher over 2005. It was estimated at 26.04 tonnes in 2006. Yield for 2007 sugar beet crop was the second highest at 25.06 tonnes per acre just about one tonne lower than the record yield in 2006. In 1998, yield per acre was the third highest at 23.32 tonnes.

Yield per acre has also shown considerable variation from 1980 to 2008. During the last 28 years it has ranged from 15.22 tonnes per acre in 2002 to over 26 tonnes per acre in 2006. Average yield per acre of 18.92 tonnes for the 1999 sugar beet crop was lower by about 19 percent from a year earlier, i.e., 23.32 tonnes in 1998. Yield per acre did increase by 16 percent in 2000 over the yield in 1999. Because of dry weather conditions, yield per acre for the 2001 beet crop dropped by 16 percent to 18.38 tonnes over the yield of 21.9 tonnes in 2000. Average yield per acre for the 2002 beets crop was the lowest at 15.22 tonnes during the last 28 years. Such a drastic decrease in yield in 2002 could be attributed to weather resulting in overall poor production conditions both during growing and harvest seasons. Average yield per acre for the 2003 beet crop increased by almost 51 percent to 22.93 tonnes over the yield in 2002. Increase in yield was primarily due to favourable weather conditions and availability of water. Average yield per acre for the 2004 beet crop decreased by about eight (8) percent to 21.19 tonnes over in 2003. In 2005, average beet yield decreased by six (6) percent to 19.85 tonnes per acre. However, it set a new record of 26.04 tonnes per acre for the 2006 beets crop.

Beet prices have also fluctuated quite dramatically during the last twenty seven years, i.e., 1980 to 2007. Prices have ranged from about \$31 per tonne in 1986 to \$67 per tonne in

1980, a 116 percent difference³. For the 1999 crop, price per tonne of sugar beets increased by four (4) percent to \$35.30 from \$33.82 per tonne in 1998. The 1998 sugar beets price was the third lowest (\$33.82 per tonne) after the 1984 price of \$31.49 per tonne and \$32.25 per tonne in 2000. Beet price received by Alberta producers for the 2001 crop was \$46.21 per tonne, about 43 percent above the price in 2000. However, beet price received for the 2002 crop decreased by about 20 percent from the previous year to \$36.74 per tonne. Beet prices for the 2003 crop increased by 16 percent to \$42.62 per tonne over the price in 2002. Final price for the 2004 beet crop increased by about three (3) percent to \$44.05. It further increased by over two (2) percent to \$45.02 per tonne for the 2005 beet crop. Beet price for the 2006 crop was \$40.58 per tonne. For the 2007 beets crop, final price was \$43.24 per tonne, an increase of 6.5 percent over in 2006.

Details of sugar beet production in Alberta, contracted, planted and harvested acres, yield per acre and dollars per tonne received by beet producers from 1980 to 2008, are presented in Table 1 on the next page. Figures 1 to 6 present trends for beet production from 1980 to 2008 on acres contracted, acres planted, acres harvested, tonnage harvested, yield per acre (tonnes), and dollars per tonne (price). Final price for the 2008 sugar beet crop will be available sometime in October/November 2009.

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, 1980-2008						
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	18,400	18,300	18,234	385,199	21.17	N/A

Source: Alberta Sugar Beet Growers, 83rd 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, 1980-2008

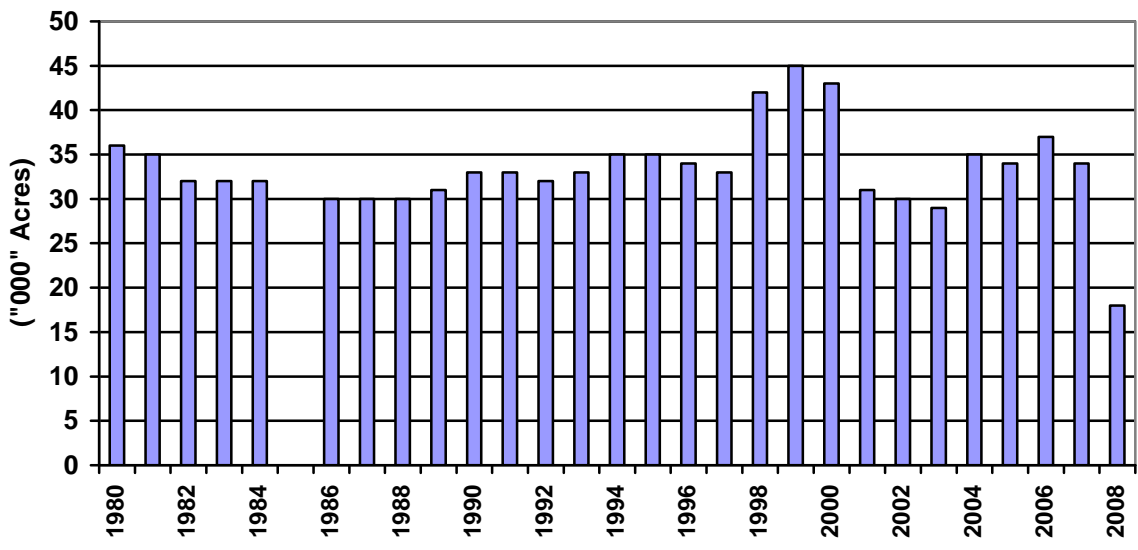


Figure 2: Sugar Beet Acres Planted in Alberta, 1980-2008

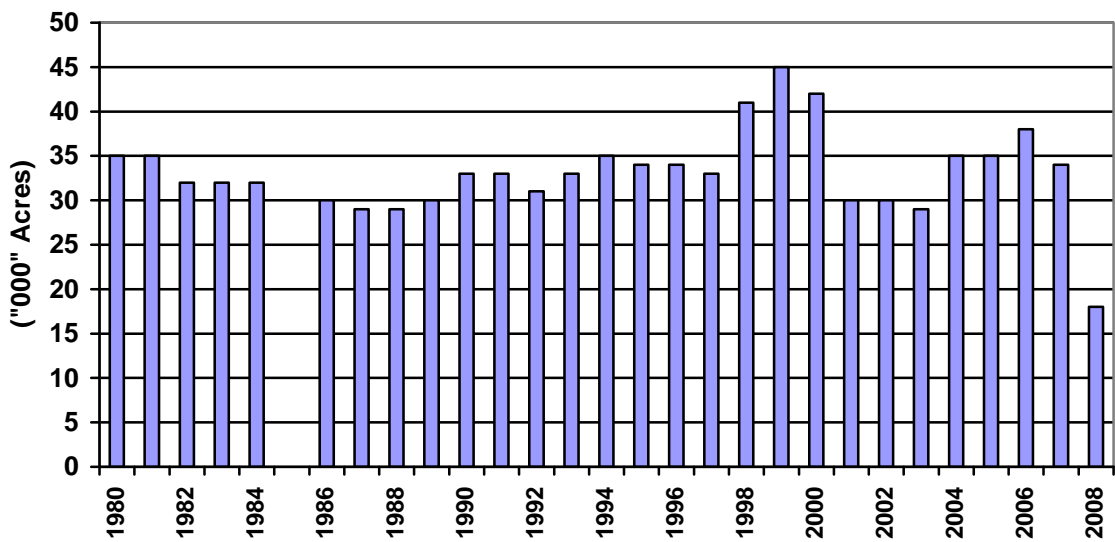


Figure 3: Sugar Beet Acres Harvested in Alberta, 1980-2008

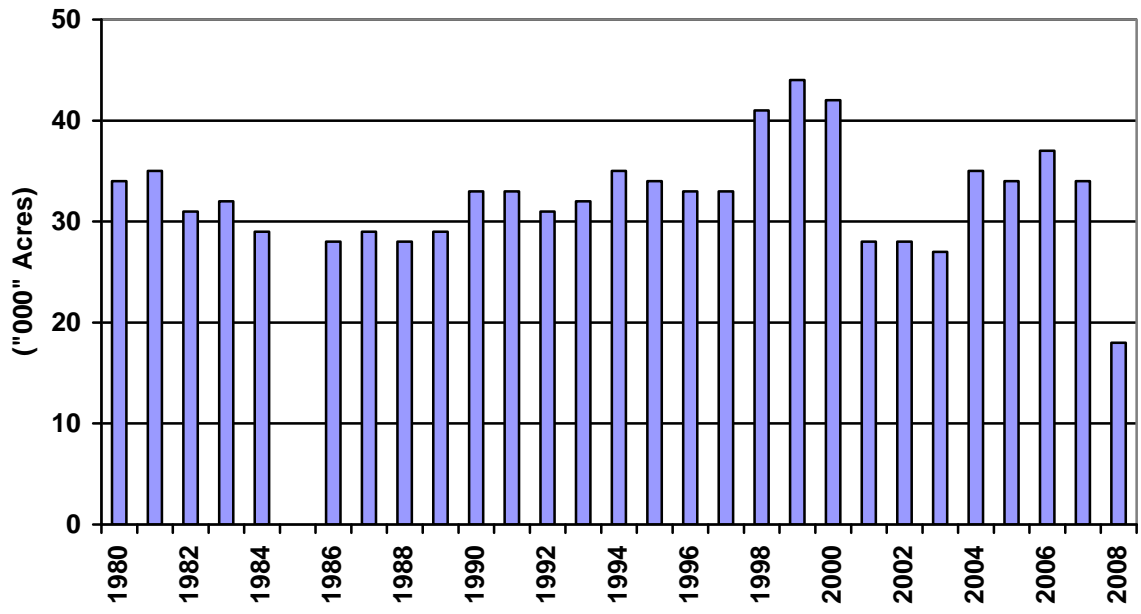


Figure 4: Sugar Beet Tonnage Harvested in Alberta, 1980-2008

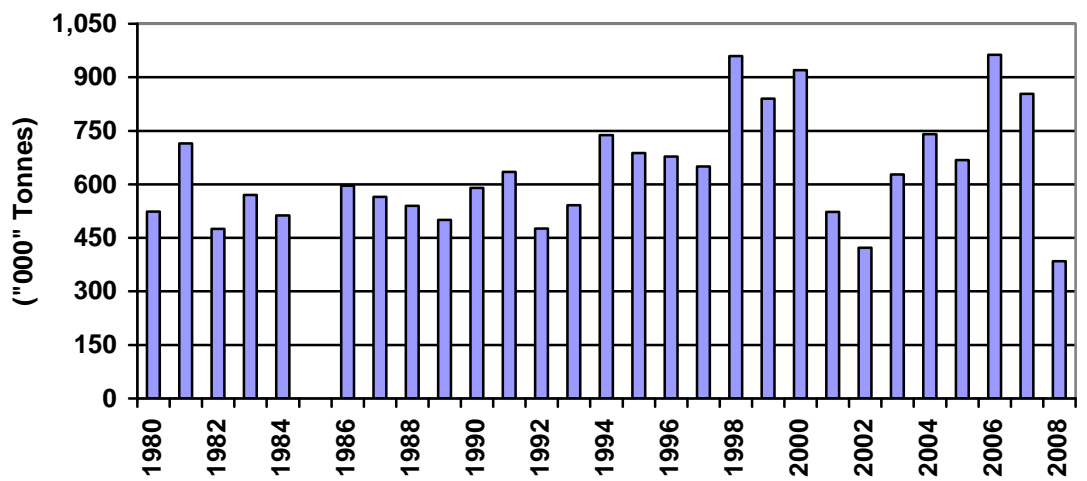


Figure 5: Sugar Beet Yield per Acre (Tonnes) in Alberta, 1980-2008

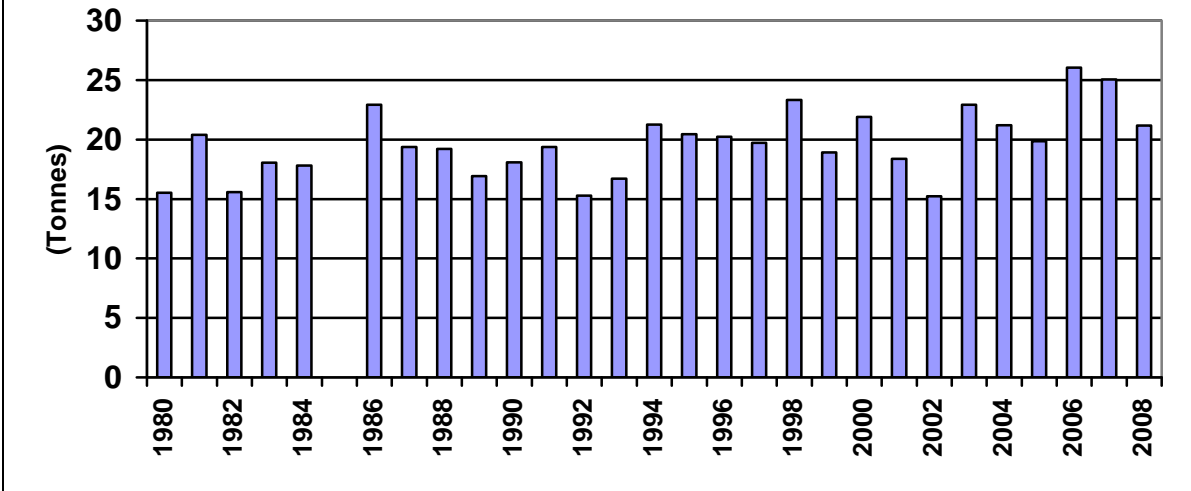
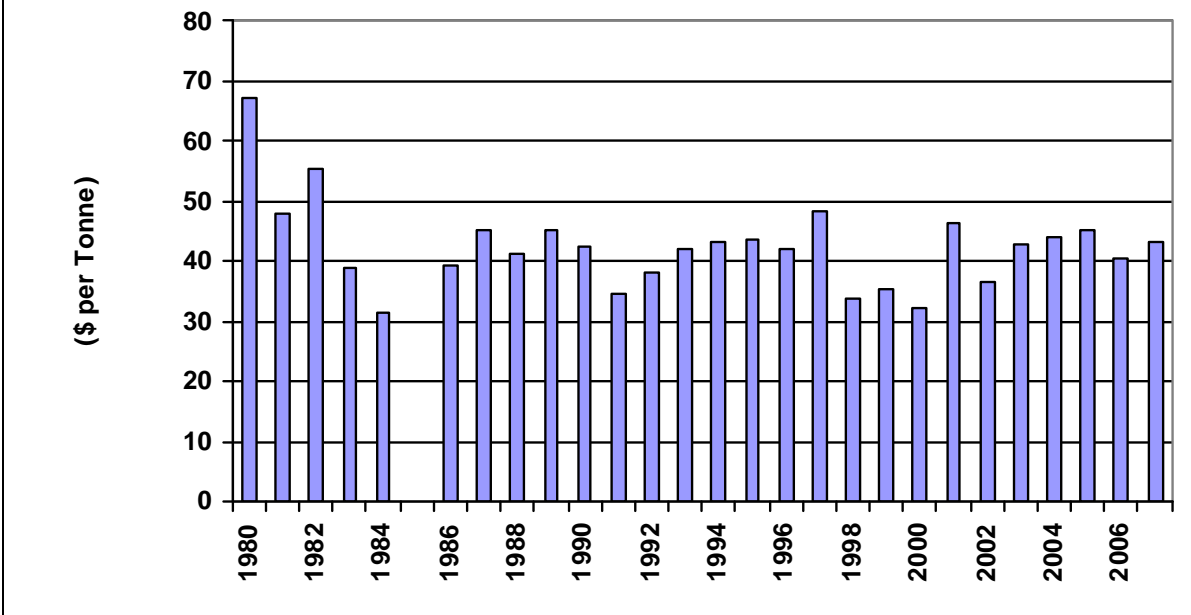


Figure 6: Sugar Beet Price per Tonne in Alberta, 1980-2007



SECTION IV

SUGAR BEET PRODUCTION COSTS AND RETURNS, 2007

The 2007 sugar beet study sample comprised of seventeen (17) sugar beet producers (44 fields) who provided detailed information on their operations. The study sample of seventeen (17) beet producers was considered adequate to develop costs and returns data for the 2007 beet crop. It was divided into two groups to develop production costs and returns for beets grown on owned (27 fields) and rented (17 fields) land.

a) **Gross Returns**

Table 2 presents production costs and returns for the entire study sample of 17 sugar beet producers (44 fields). Average yield reported by the study participants in 2007 was 26.19 tonnes per acre with an average area of about 95 acres of beets per farm. Average yield for the study sample was higher by about five (5) tonnes compared to the provincial average. With an estimated price of \$43.24 per tonne, average value of production was \$1,132 per acre. When miscellaneous receipts (crop insurance, rebates, patronage, custom work and other government program payments) were included, average gross revenue per acre increased to \$1,162 per acre or \$44.37 per tonne. Final price for the 2007 beets crop was announced in early November. A detailed breakdown of gross returns for the 2007 beet crop is presented in Section A of Table 2.

b) **Variable Costs**

Detailed breakdown of various input costs is presented in Table 2. All of the costs are weighted averages and expressed on a per acre and per tonne basis. Input costs (seed, fertilizer and chemicals) amounted to \$195 per acre or \$7.46 per tonne. Average trucking/marketing costs, fuel, repair costs (machinery and buildings) and utilities were \$341 per acre (\$13.01 per tonne) for the 2007 sugar beets crop.

Other most significant cost items for the 2007 sugar beet crop were unpaid and paid labour, hail/crop insurance, custom work and specialized labour which accounted for

\$136 per acre \$5.19 per tonne or 20 percent of total variable costs. Unpaid family and operator labour amounted to \$52 per acre (\$1.99 per tonne). Figure 7 shows a graphical presentation of variable costs for the study sample (17 sugar beet producers), beets grown on owned and rented land on a per acre basis for the 2007 sugar beet crop.

c) Cash Costs

For the purposes of this study direct cash costs do not include expenses associated with unpaid family and management labour. Direct cash costs for the study sample of 17 beet producers for the 2007 crop amounted to \$626 per acre or \$24 per tonne (Table 2). However, total variable costs including unpaid family and operator labour were \$678 per acre (\$26 per tonne).

Cash costs for sugar beets grown on owned and rented land (Tables 3 & 4) were \$634 (\$25 per tonne) and \$616 (\$23 per tonne), respectively. Total variable costs for beets produced on owned land were \$688 per acre (\$27 per tonne) compared with \$667 per acre (\$25 per acre) for beets produced on rented land.

d) 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).

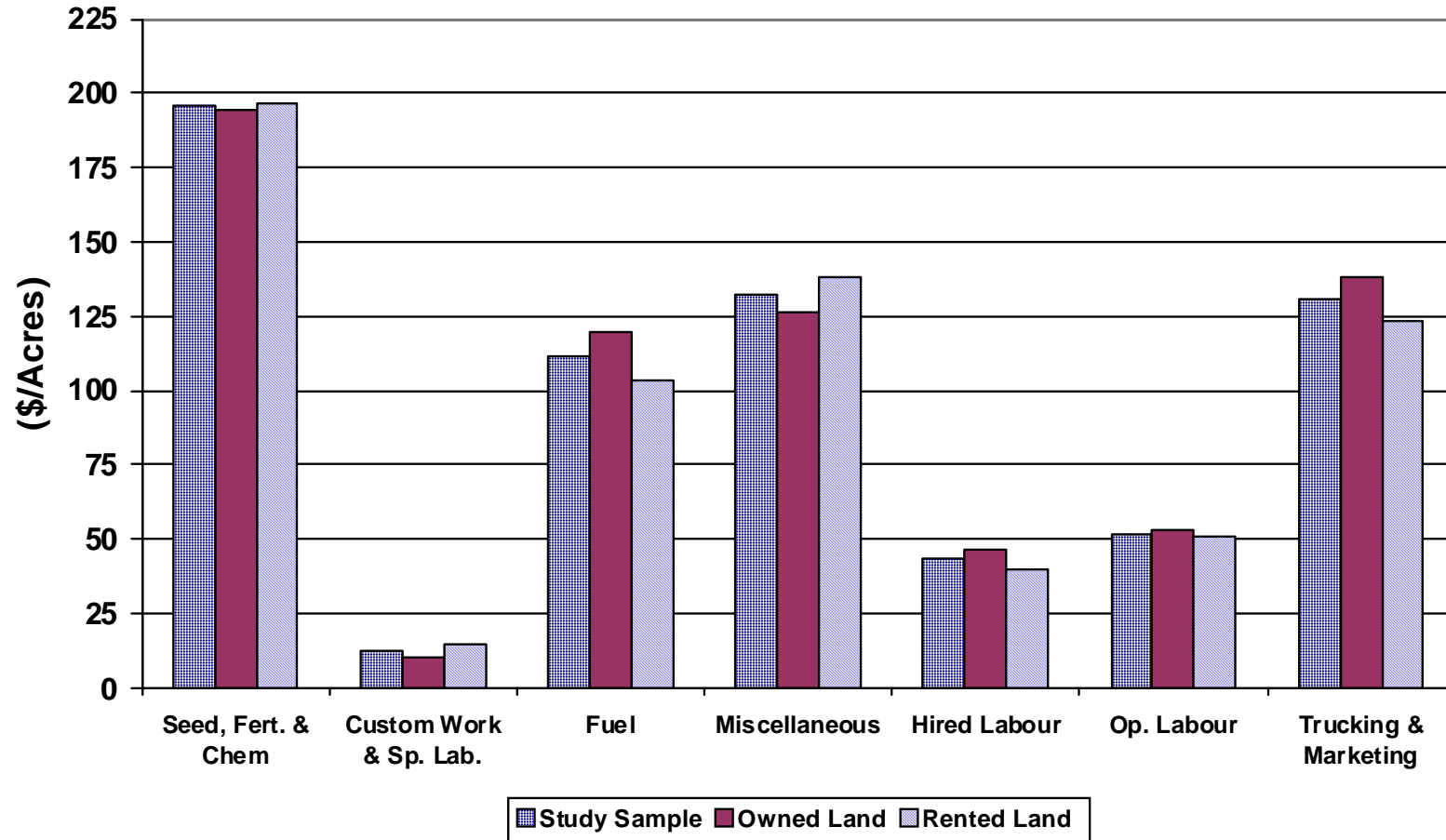
Capital costs for the study sample amounted to \$269 per acre (\$10.26 per tonne) for the 2007 beet crop. These were almost 28 percent of total costs of sugar beet production in 2007. Capital costs were \$242 per acre and about 26 percent (Table 3) of total costs for sugar beets produced on owned land compared to \$295 or 31 percent (Table 4) for beets produced on rented land.

Table 2: Sugar Beet Production Costs and Returns, 2007 (44 Enterprises)			
Acres Cropped	95.15	\$ per acre	\$ per tonne
Yield Per Acre	26.19		
GROSS RETURNS			
Crop Sales		1,132.32	43.24
Crop Insurance Receipts		20.72	
Miscellaneous Receipts		8.87	
A. TOTAL GROSS RETURNS		1,161.91	44.37
VARIABLE COSTS			
Seed		53.98	
Fertilizer		54.54	
Chemicals		86.96	
Hail/Crop Insurance		28.24	
Machine Fuel (Net of Rebate)		72.71	
Irrigation Fuel		39.12	
Repairs – Machinery		61.64	
Repairs – Buildings		6.52	
Utilities, Insurance & Overhead		16.20	
Association Fees & Research Levies		13.82	
Custom Work and Specialized Labour		12.34	
Trucking and Marketing		130.80	
Operating Interest Paid		5.63	
Paid Labour		43.25	
Unpaid Family & Operator Labour		51.99	
B. TOTAL VARIABLE COSTS		677.75	25.88
C. DIRECT CASH COSTS (Total Variable Costs - Unpaid Labour)		625.76	23.89
CAPITAL COSTS			
Cash Rent/Crop Share		85.59	
Taxes, Water Rates & Insurance		27.30	
Equipment/Building Depreciation		112.92	
Lease Payment		19.87	
Paid Capital Interest		23.00	
D. TOTAL CAPITAL COSTS		268.68	10.26
E. TOTAL PRODUCTION COSTS (B+D)		946.43	36.14
F. NET RETURNS			
Return to Capital (A-B)		484.16	18.49
Return to Unpaid Labour (A-E + Unpaid Operator Labour)		267.47	10.21
Return to Investment (A-E + Paid Capital Interest)		238.48	9.11
Return to Equity (A-E)		215.48	8.23
INVESTMENT			
Land & Buildings		1,770.61	
Machinery		1,169.32	

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

Figure 7

Variable Costs Breakdown for Sugar Beets, 2007



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

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 2007 crop was \$173 per acre (\$6.47 per tonne) for the 17 fields used to grow sugar beets on rented land (Table 4). Land rent represents about 18 percent of total production costs for these producers.

Taxes, water rates and insurance for the study participants for the 2007 beet crop were estimated at \$27 per acre or about \$1.04 per tonne. These were about \$45 per acre (\$1.76 per tonne) for beets grown on owned land versus \$9 per acre (\$0.34 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 \$113 per acre (\$4.31 per tonne) for the study sample. For beets produced on owned land, depreciation costs were \$142 per acre (\$5.51 per tonne) (Table 3) compared to about \$83 per acre (\$3.11 per tonne) for beets produced on rented land (Table 4). Figure 8 shows the relative proportions of all costs for sugar beet production in 2007 for the 17 sugar beet producers with 44 fields.

e) Total Production Costs

Total production costs for sugar beet production for the study sample of 17 beet producers (average of all 44 fields) were estimated at \$946 per acre (\$36 per tonne) in 2007. Of this, 66 percent were direct cash costs, almost 28 percent capital costs and the remaining six (6) percent for unpaid operator labour (Table 2). Tables 3 and 4 present total production costs for beets produced on owned and rented land, respectively.

f) Net Returns

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

Return to Capital:

Return to capital is also known as gross margin. It is the difference between gross returns less variable costs. This is the amount of money left to pay for overhead costs (land rental, taxes and insurance), depreciation and capital interest and management. Average return to capital was \$484 per acre (\$18.49 per tonne) for the entire study sample of 17 beet producers. It was \$474 per acre (\$18.42 per tonne) for beet produced on owned land and \$494 per acre (\$18.55 per tonne) on rented land.

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 17 beet producers was positive at \$267 per acre or \$10.21 per tonne. Return to unpaid labour for beets grown on owned land was positive at \$284 per acre (\$11.05 per tonne). It was also positive for beets produced on rented land by \$250 per acre (\$9.39 per tonne). Details on return to unpaid labour for the study sample, beets grown on owned and rented land are presented in Tables 2, 3 and 4 under Net Returns (F).

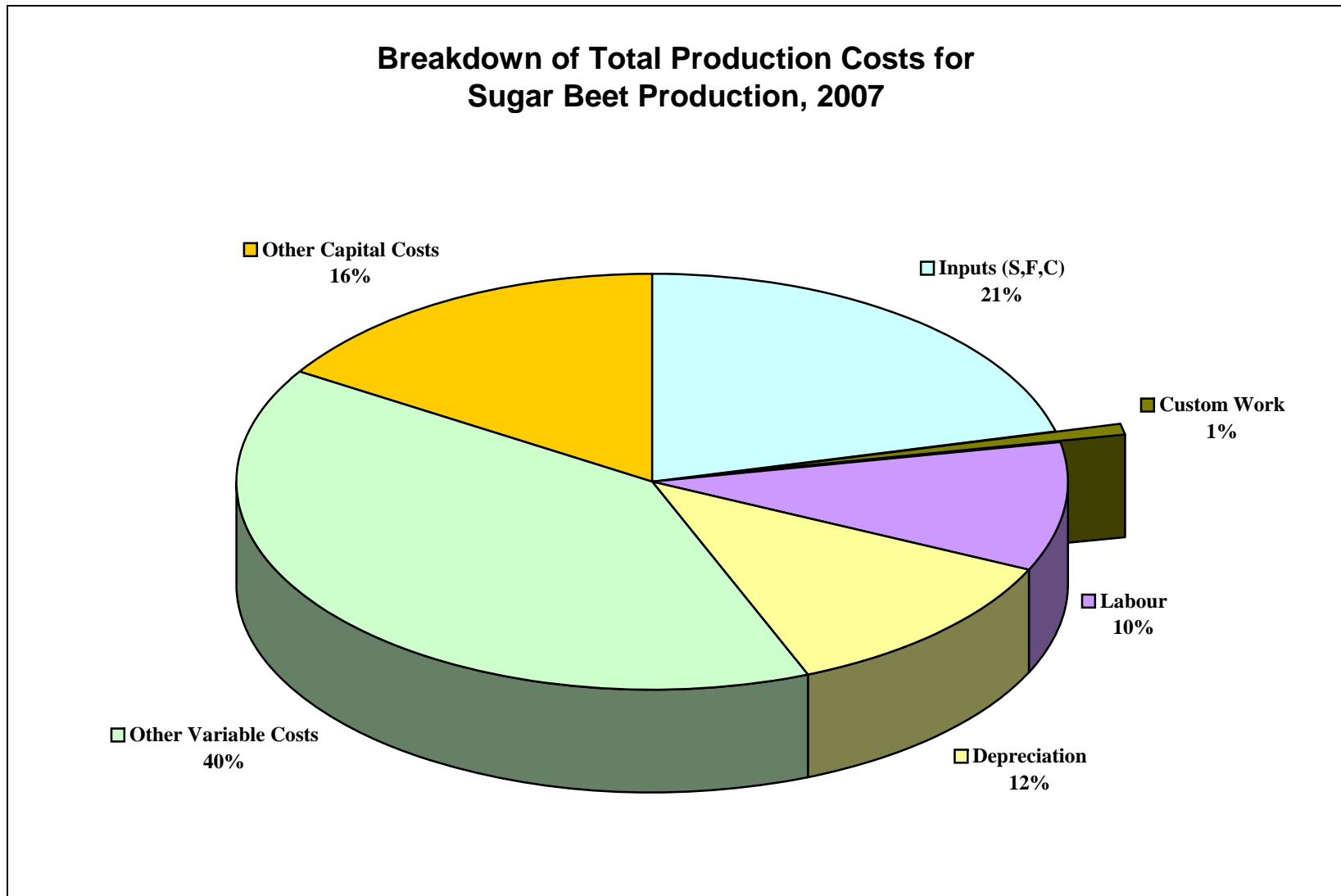
Return to Investment:

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 \$238 per acre or \$9.11 per tonne in 2007 (Table 2). It was positive at \$266 per acre (\$10.33 per tonne) for beets produced on owned land (Table 3). Return to investment was also positive at \$211 per acre (\$7.90 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 \$215 per acre or \$8.23 per tonne for the study sample of 17 beet producers with 44 fields (Table 2). It was positive at \$232 per acre (\$9.09 per tonne) for beets produced on owned land (27 fields, Table 3). Return to equity was also positive at \$199 per acre or \$7.47 per tonne for beets produced on rented land (17 fields, Table 4).

Figure 8



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

Table 3: Sugar Beet Production Costs and Returns, Owned Land, 2007			
(27 Enterprises)			
Acres Cropped	78.13	\$ per acre	\$ per
Yield Per Acre	25.74 tonnes		tonne
GROSS RETURNS			
Crop Sales		1,112.81	43.24
Crop Insurance Receipts		41.12	
Miscellaneous Receipts		8.54	
A. TOTAL GROSS RETURNS		1,162.47	45.17
VARIABLE COSTS			
Seed		53.98	
Fertilizer		54.42	
Chemicals		86.23	
Hail/Crop Insurance		28.27	
Machine Fuel (Net of Rebate)		82.62	
Irrigation Fuel		37.33	
Repairs – Machinery		58.15	
Repairs – Buildings		6.85	
Utilities, Insurance & Overhead		14.43	
Association Fees & Research Levies		13.59	
Custom Work & Specialized Labour		10.14	
Trucking and Marketing		138.12	
Operating Interest Paid		4.97	
Paid Labour		46.43	
Unpaid Family & Operator Labour		52.75	
B. TOTAL VARIABLE COSTS		688.28	26.74
C. DIRECT CASH COSTS (Total Variable Costs - Unpaid Labour)		635.53	24.69
CAPITAL COSTS			
Cash Rent/Crop Share		0.00	
Taxes, Water Rates & Insurance		45.27	
Equipment/Building Depreciation		141.95	
Lease Payments		21.06	
Paid Capital Interest		34.16	
D. TOTAL CAPITAL COSTS		242.44	9.42
E. TOTAL PRODUCTION COSTS (B+D)		930.71	36.16
F. NET RETURNS			
Return to Capital (A-B)		474.19	18.42
Return to Unpaid Labour (A-E + Unpaid Operator Labour)		284.50	11.05
Return to Investment (A-E + Paid Capital Interest)		265.91	10.33
Return to Equity (A-E)		231.76	9.09
INVESTMENT			
Land & Buildings		3,352.57	
Machinery		1,494.92	

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

Table 4: Sugar Beet Production Costs and Returns, Rented Land, 2007			
(17 Enterprises)			
Acres Cropped	122.18	\$ per acre	\$ per
Yield Per Acre	26.65 tonnes		tonne
GROSS RETURNS			
Crop Sales		1,152.14	43.24
Crop Insurance Receipts		0.00	
Miscellaneous Receipts		9.21	
A. TOTAL GROSS RETURNS		1,161.34	43.59
VARIABLE COSTS			
Seed		53.98	
Fertilizer		54.67	
Chemicals		87.70	
Hail/Crop Insurance		28.20	
Machine Fuel (Net of Rebate)		62.65	
Irrigation Fuel		40.95	
Repairs – Machinery		65.18	
Repairs – Buildings		6.19	
Utilities, Insurance & Overhead		17.98	
Association Fees & Research Levies		14.07	
Custom Work & Specialized Labour		14.56	
Trucking and Marketing		123.36	
Operating Interest Paid		6.29	
Paid Labour		40.02	
Unpaid Family & Operator Labour		51.23	
B. TOTAL VARIABLE COSTS		667.06	25.03
C. DIRECT CASH COSTS (Total Variable Costs - Unpaid Labour)		615.83	23.11
CAPITAL COSTS			
Cash Rent/Crop Share		172.51	
Taxes, Water Rates & Insurance		9.06	
Equipment/Building Depreciation		83.44	
Lease Payment		18.66	
Paid Capital Interest		11.67	
D. TOTAL CAPITAL COSTS		295.34	11.08
E. TOTAL PRODUCTION COSTS (B+D)		962.40	36.11
F. NET RETURNS			
Return to Capital (A-B)		494.28	18.55
Return to Unpaid Labour (A-E + Unpaid Operator Labour)		250.18	9.39
Return to Investment (A-E + Paid Capital Interest)		210.62	7.90
Return to Equity (A-E)		198.95	7.47
INVESTMENT			
Land & Buildings		163.90	
Machinery		840.65	

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

SECTION V

SUGAR BEET PRODUCTION COSTS AND RETURNS BY SIZE OF OPERATION, 2007

The study sample of 17 beet producers (44 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. Number of sugar beet fields in Group I was nine (9) with an average size of 31 acres or seven (7) per cent of the area surveyed for the 2007 study. Average yield for this group of beet producers was 21.83 tonnes per acre, significantly lower than other two groups. Gross revenue for Group I participants was \$944 per acre. When crop insurance and miscellaneous receipts were added to crop sales, gross return per acre increased to \$972 (\$44.51 per tonne). Average variable costs for this group of beet study participants were estimated at \$654 per acre (\$29.98 per tonne). Direct cash costs for Group I participants were \$609 per acre or \$27.91 per tonne. Average capital costs for this group of beet producers, i.e. up to 50 acres were estimated at \$267 per acre (\$12.22 per tonne). Total production costs for study participants in Group I amounted to \$921 per acre or \$42.40 per tonne, somewhat lower than both Group II and Group III. Net returns to capital were positive at \$317 per acre (\$12.22 per tonne). Return to unpaid labour for this Group was positive at \$96 per acre (\$4.38 per tonne) for the 2007 beet crop. Similarly, returns to investment and equity were also positive at \$87 per acre (\$3.99 per tonne), and \$51 per acre (\$2.31 per tonne), respectively. Detailed breakdown of gross returns, variable costs, capital costs, total production costs and net returns for Group I (up to 50 acres) participants are presented in Table 5.

Group II (51 to 100 Acres):

Results for Group II beet participants are presented in Table 6. There were sixteen (16) beet fields in the range of 50 to 100 acres with an average field size of 66.16 acres. This Group represented almost 25 percent of the sugar beet area surveyed for the 2007 crop. Average yield per acre for this group was at 26.08 tonnes. Average gross revenue for participants in Group II amounted to \$1,128 per acre or \$43.24 per tonne. Variable costs were estimated at \$682 per acre (\$26.13 per tonne). Capital costs for this group were estimated at \$249 per acre (\$9.50 per tonne). Average total production costs for the 16 sugar beet fields were \$929 per acre or \$35.63 per tonne. Net returns to capital were positive at \$456 per acre (\$17.49 per tonne). Average net returns to unpaid labour and investment were positive at \$257 per acre (\$9.84 per tonne) and \$247 per acre (\$9.28 per tonne), respectively. Net returns to equity were also positive at \$208 per acre (\$7.28 per tonne). Detailed breakdown of costs and returns is presented in (Table 6). This group of beet producers (Group II) had significantly higher net returns 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 was 150 acres or about 68 percent of the beet area surveyed for the 2007 crop. This group of beet producers had nineteen (19) beet fields in 2007. Average beet yield per acre was the highest for this group at 26.65 tonnes per acre. Gross revenue for Group III beet producers was \$1,189 per acre (\$44.63 per tonne). Variable costs were calculated at \$679 per acre or \$23 per tonne. Capital costs for this group were \$277 per acre (\$10.38 per tonne). Total production costs for these participants were \$955 per acre (\$35.85 per tonne). Net returns to capital were positive for this Group of participants at \$511 per acre (\$19.16 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 given in Table 7.

Table 5: Sugar Beet Production Costs and Returns by Size of Operation			
(Up to 50 Acres), 2007 (9 Enterprises)			
Acres Cropped	30.56	\$ per	\$ per
Yield Per Acre	21.83 tonnes	acre	tonne
GROSS RETURNS			
Crop Sales		943.83	43.24
Crop Insurance Receipts		13.45	
Miscellaneous Receipts		14.37	
A. TOTAL GROSS RETURNS		971.65	44.51
VARIABLE COSTS			
Seed		53.98	
Fertilizer		70.11	
Chemicals		63.29	
Hail/Crop Insurance		25.95	
Machine Fuel (Net of Rebate)		72.61	
Irrigation Fuel		54.96	
Repairs - Machinery		37.15	
Repairs - Buildings		13.03	
Utilities, Insurance & Overhead		25.78	
Association Fees & Research Levies		11.52	
Custom Work & Specialized Labour		7.73	
Trucking and Marketing		99.89	
Operating Interest Paid		15.50	
Paid Labour		57.87	
Unpaid Family & Operator Labour		45.06	
B. TOTAL VARIABLE COSTS		654.34	29.98
C. DIRECT CASH COSTS (Total Variable Costs - Unpaid Labour)		609.28	27.91
CAPITAL COSTS			
Cash Rent/Crop Share		20.22	
Taxes, Water Rates & Insurance		59.08	
Equipment/Building Depreciation		150.97	
Lease Payment		0.00	
Paid Capital Interest		36.52	
D. TOTAL CAPITAL COSTS		266.79	12.22
E. TOTAL PRODUCTION COSTS (B+D)		921.13	42.20
F. NET RETURNS			
Return to Capital (A-B)		317.31	14.54
Return to Unpaid Labour (A-E + Unpaid Operator Labour)		95.58	4.38
Return to Investment (A-E + Paid Capital Interest)		87.04	3.99
Return to Equity (A-E)		50.52	2.31
INVESTMENT			
Land & Buildings		2,600.40	
Machinery		1,391.62	

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

Table 6: Sugar Beet Production Costs and Returns by Size of Operation			
(51 to 100 Acres), 2007 (16 Enterprises)			
Acres Cropped	66.16	\$ per acre	\$ per
Yield Per Acre	26.08 tonnes		tonne
GROSS RETURNS			
Crop Sales		1,127.80	43.24
Crop Insurance Receipts		2.53	
Miscellaneous Receipts		7.22	
A. TOTAL GROSS RETURNS		1,137.56	43.61
VARIABLE COSTS			
Seed		53.98	
Fertilizer		61.99	
Chemicals		83.14	
Hail/Crop Insurance		26.51	
Machine Fuel (Net of Rebate)		81.59	
Irrigation Fuel		37.91	
Repairs - Machinery		63.91	
Repairs - Buildings		7.43	
Utilities, Insurance & Overhead		22.79	
Association Fees & Research Levies		13.77	
Custom Work & Specialized Labour		10.45	
Trucking and Marketing		131.87	
Operating Interest Paid		6.49	
Paid Labour		31.38	
Unpaid Family & Operator Labour		48.32	
B. TOTAL VARIABLE COSTS		681.53	26.13
C. DIRECT CASH COSTS (Total Variable Costs - Unpaid Labour)		633.21	24.28
CAPITAL COSTS			
Cash Rent/Crop Share		40.94	
Taxes, Water Rates & Insurance		35.25	
Equipment/Building Depreciation		131.99	
Lease Payment		5.93	
Paid Capital Interest		33.69	
D. TOTAL CAPITAL COSTS		247.80	9.50
E. TOTAL PRODUCTION COSTS (B+D)		929.32	35.63
F. NET RETURNS			
Return to Capital (A-B)		456.03	17.49
Return to Unpaid Labour (A-E + Unpaid Operator Labour)		256.56	9.84
Return to Investment (A-E + Paid Capital Interest)		241.92	9.28
Return to Equity (A-E)		208.23	7.28
INVESTMENT			
Land & Buildings		2,364.55	
Machinery		1,399.09	

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

Table 7: Sugar Beet Production Costs and Returns by Size of Operation (Over 100 Acres), 2007 (19 Enterprises)			
Acres Cropped	150.16	\$ per acre	\$ per tonne
Yield Per Acre	26.65 tonnes		
GROSS RETURNS			
Crop Sales		1,152.16	43.24
Crop Insurance Receipts		28.17	
Miscellaneous Receipts		8.95	
A. TOTAL GROSS RETURNS		1,189.28	44.63
VARIABLE COSTS			
Seed		53.98	
Fertilizer		50.28	
Chemicals		90.66	
Hail/Crop Insurance		29.10	
Machine Fuel (Net of Rebate)		69.43	
Irrigation Fuel		38.05	
Repairs – Machinery		63.16	
Repairs – Buildings		5.56	
Utilities, Insurance & Overhead		12.83	
Association Fees & Research Levies		14.07	
Custom Work & Specialized Labour		13.49	
Trucking and Marketing		133.38	
Operating Interest Paid		4.35	
Paid Labour		46.24	
Unpaid Family & Operator Labour		54.02	
B. TOTAL VARIABLE COSTS		678.60	25.47
C. DIRECT CASH COSTS (Total Variable Costs - Unpaid Labour)		624.58	23.44
CAPITAL COSTS			
Cash Rent/Crop Share		108.45	
Taxes, Water Rates & Insurance		21.29	
Equipment/Building Depreciation		102.18	
Lease Payment		26.98	
Paid Capital Interest		17.74	
D. TOTAL CAPITAL COSTS		276.62	10.38
E. TOTAL PRODUCTION COSTS (B+D)		955.22	35.85
F. NET RETURNS			
Return to Capital (A-B)		510.68	19.46
Return to Unpaid Labour (A-E + Unpaid Operator Labour)		288.09	10.81
Return to Investment (A-E + Paid Capital Interest)		251.80	9.45
Return to Equity (A-E)		234.07	8.78
INVESTMENT			
Land & Buildings		1,470.27	
Machinery		1,062.64	

Source: Economics Unit, 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 2007 study sample of 17 beet growers (44 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. Variable Costs
3. Gross Margin
4. Return to Equity

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.

As mentioned above, several conclusions can be drawn from the results presented in Table 8. Total sugar beet production costs for the large 1/3 group of producers were \$1,085 per acre compared with \$773 for the small 1/3 group. Gross margin for the large 1/3 group was positive at \$533 per acre compared with \$173 per acre for the small 1/3 group. Return to equity for the bottom 1/3 (small) group was marginally positive at \$3 per acre. It was \$353 per acre for the large 1/3 group. Higher management rating is associated with high gross margin and return to equity.

Table 8 provides a cross-section of management factors. 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. For example, in 2007 return to equity for the large 1/3 group of beet producers was \$353 per acre compared to only \$3 per acre for the small 1/3 group. Yield per acre was higher by about 9 tonnes for the large 1/3 group over the small 1/3 group. Gross margin for the large 1/3 group as mentioned above was \$533 per acre compared to \$173 per acre for small 1/3 producer. Overall management rating between the two groups was significantly apart, i.e. 3 versus 1 (large versus small).

TABLE 8: PROFILE OF MANAGEMENT FACTORS FOR SUGAR BEET PRODUCTION, 2007

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	158.53	26.96	12.20	48.14	808.72	968.90	391.33	231.15	1,286.67	239.19	998.73	163.73	2.03
	43.00	21.93	10.38	52.36	712.27	890.17	260.57	82.67	1,613.33	381.65	947.71	213.16	1.75
Yield	92.57	29.68	13.03	52.62	828.65	1,018.90	472.02	281.77	2,006.67	189.79	1,051.99	423.64	2.40
(Tonne/Acre)	85.87	20.27	7.69	54.33	667.43	842.68	255.37	80.12	1,980.00	366.58	919.90	218.55	1.68
Special Custom	92.30	25.42	31.60	80.61	838.90	1,036.19	315.99	118.70	1,666.67	391.22	787.73	280.25	1.80
(\$/Acre)	116.27	24.32	0.00	43.60	689.42	836.10	375.17	228.49	2,100.00	273.18	848.69	224.57	2.12
Unpaid Labour	95.40	26.37	20.06	98.41	757.60	974.03	422.24	205.80	1,820.00	303.65	892.96	218.10	2.23
(\$/Acre)	119.87	26.08	3.07	14.00	809.39	963.91	345.85	191.33	1,753.33	206.38	1,199.91	320.93	1.87
Cash costs	117.93	27.67	16.70	39.74	900.84	1,065.30	314.80	150.34	1,413.33	221.54	1,109.81	207.42	1.77
(\$/Acre)	68.07	21.39	2.03	54.75	612.54	788.06	335.35	159.84	1,933.33	380.56	895.68	230.41	2.00
Total Costs	99.93	27.83	20.70	64.94	885.37	1,085.41	342.33	142.29	1,880.00	174.59	1,093.55	327.76	1.90
(\$/Acre)	99.07	22.76	0.87	47.85	618.38	773.24	377.81	222.94	1,733.33	215.20	833.47	247.55	2.13
Gross Margin	99.43	27.73	12.11	70.99	708.37	908.64	533.24	332.98	1,926.67	221.31	899.67	410.14	2.60
(\$/Acre)	69.60	21.09	11.07	42.31	761.54	926.54	172.83	7.83	1,593.33	382.11	942.01	188.15	1.38
Return to Equity	119.00	28.09	9.07	56.55	732.33	890.69	510.94	352.58	1,426.67	213.03	803.55	218.93	2.55
(\$/Acre)	64.27	21.03	10.33	46.31	758.72	929.19	173.02	2.55	1,593.33	378.13	960.03	188.15	1.40
Land Investment	86.73	25.66	9.86	51.93	763.24	959.23	393.87	197.88	3,553.33	303.50	1,065.29	436.82	2.03
(\$/Acre)	128.90	27.26	21.58	62.83	829.47	984.44	362.05	207.09	0.00	188.88	813.61	99.14	2.05
Buildings Investment	87.27	25.07	9.11	53.65	752.97	936.85	361.93	178.05	2,420.00	571.55	923.34	256.32	1.98
(\$/Acre)	119.87	25.30	12.15	54.02	757.91	918.25	381.67	221.33	1,353.33	95.49	902.88	235.12	2.08
Machine Investment	91.13	26.22	2.05	28.09	790.25	983.98	367.04	173.31	2,113.33	215.26	1,434.85	347.58	2.00
(\$/Acre)	101.50	23.55	9.18	56.44	693.15	843.44	350.42	200.13	1,473.33	456.29	587.81	206.03	2.03
Irrigation Investment	88.70	27.19	8.58	45.17	751.10	963.04	449.44	237.49	3,106.67	219.43	1,120.07	691.04	2.23
(\$/Acre)	122.00	25.38	19.80	75.76	789.74	951.95	335.81	173.61	786.67	461.24	689.16	0.00	1.93
Overall Management*	100.37	28.09	12.11	67.41	725.24	913.57	532.14	343.80	1,893.33	223.91	828.53	395.52	3.00
(\$/Acre)	69.60	21.09	11.07	42.31	761.54	926.54	172.83	7.83	1,593.33	382.11	942.01	188.15	1.00
Weighted Average(\$/Ac.)	95.15	26.19	12.34	51.99	781.51	946.43	380.40	215.48	1,554.16	216.45	931.15	238.17	2.00

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

SECTION VI

COMPARISON OF COSTS AND RETURNS, 1998-2007

Table 9 presents a ten year (1998 to 2007) comparison of costs and returns for sugar beet production in Alberta. Gross returns during the last ten years have ranged from \$636 per acre in 2002 to \$1,162 per acre in 2007. Total production costs during the same period have ranged from \$715 in 2002 to \$946 per acre in 2007. For the 2007 beet crop, overall production costs increased by about four (4) percent over the costs for the 2006 beet crop. During the last ten years, net returns to capital were the highest in 2006 at \$486 per acre and lowest at \$133 per acre for the 2002 beet crop. Net returns to capital for the 2007 beet crop was very close to the 2006 crop. Returns to unpaid labour ranged from a negative \$18 per acre in 2003 to positive \$287 per acre in 2006. In 2007, returns to investment and equity although marginally lower from the previous year but significantly better than 1998 to 2005 figures. Average net returns to investment and equity for the 2007 beet crop were \$238 and \$215 per acre, respectively. Returns to capital, unpaid labour, investment and equity for the 2007 beet crop remained close to the 2006 level primarily due to better yield per acre and marginally higher price.

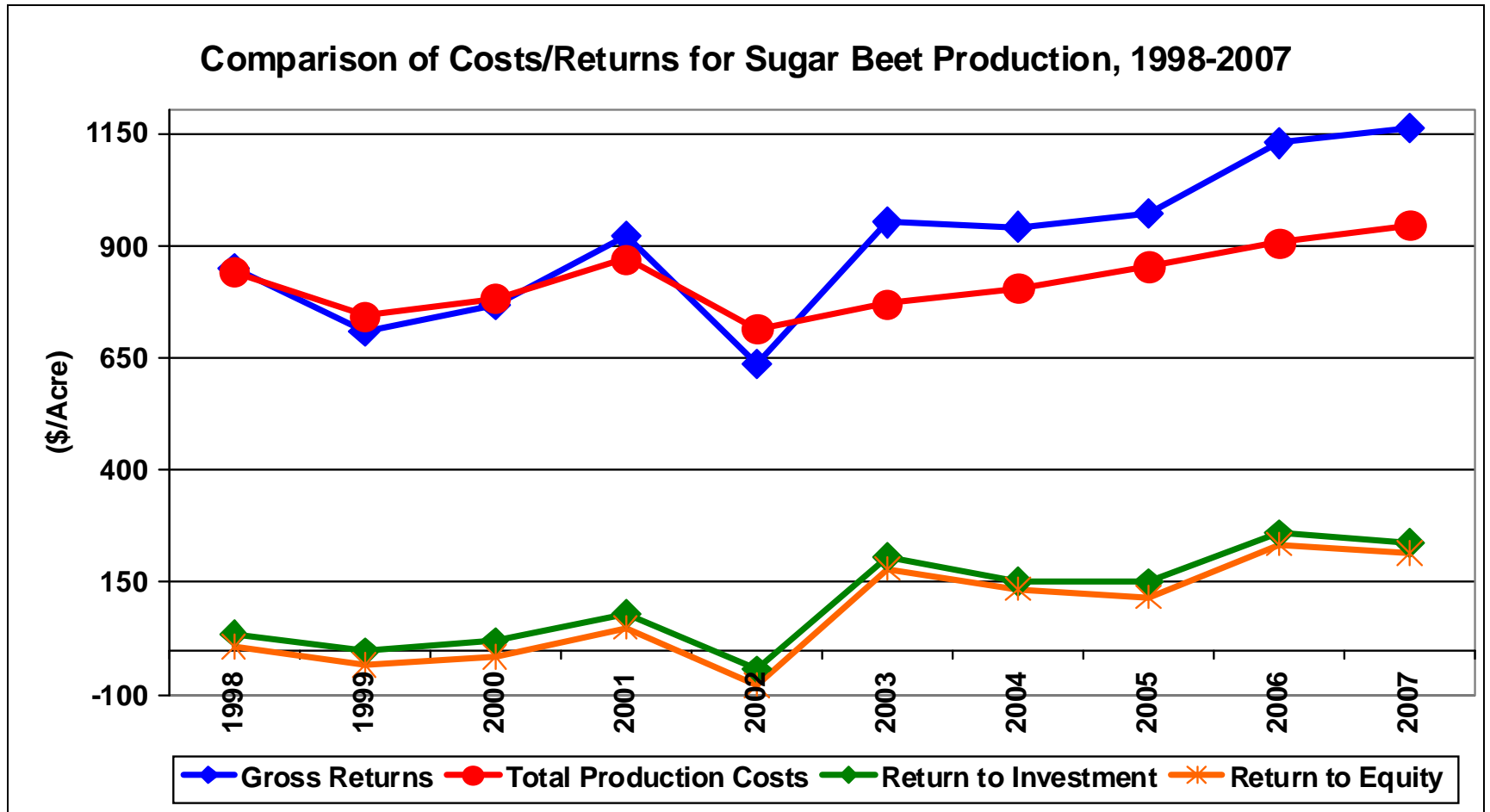
In 2007, gross revenue for the 17 sugar beet producers increased only by about three percent over 2006. Average gross revenue for the 2007 beet study participants was estimated at \$1,162 per acre compared to \$1,128 per acre for the 2006 beet crop. This small increase in gross revenue can be attributed to yield remaining steady and a marginal increase in price per tonne received by producers. Net returns to capital, unpaid labour, investment and equity have also varied considerably during the last ten years, i.e. from 1998 to 2007. Net returns to capital for the 2002 beet crop was significantly lower (almost 59 percent lower) than the previous year. Similar to gross revenue, average return to capital was much smaller compared to the previous years, i.e. 1995 to 2001. Returns to unpaid labour, investment and equity were all negative for 2002 beet study participants. However, return to capital for the 2003 and 2004 study participants increased significantly over in 2002, primarily due to increase in price and yield. Similarly, net returns to unpaid labour, investment and equity have shown remarkable improvement over the last several years. These were all significantly positive compared to the last five beet crops

(1998 to 2002). Figure 9 shows trends for the last ten years studies (1998 to 2007) of sugar beet for gross returns, total production costs and return to investment. As mentioned above, increase in gross revenue for the 2007 beet crop is attributed to relatively higher yield compared to 1998 to 2005. Average provincial yield for beets produced in 2006 was 26.04 tonnes per acre compared with 25.06 tonnes in 2007. Average yields for the study samples in 2006 and 2007 were 26.86 tonnes per acre and 26.19 tonnes per acre, respectively. Increase in gross returns for the 2007 beet crop also reflects on significantly positive net returns to capital, unpaid labour, investment and equity. Table 9 presents detailed break down of gross revenue, variable costs, direct cash costs, capital costs, net returns to capital, unpaid labour, investment and equity from 1998 to 2007.

**Table 9: Comparison of Costs and Returns for Sugar Beet Production
1998 - 2007 (\$ per acre)**

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
A. Gross Returns	848	709	767	920	636	952	941	971	1,128	1,162
B. Variable Costs	616	518	581	599	503	526	576	607	642	678
C. Direct Cash Costs	538	462	519	536	443	482	535	564	589	626
D. Capital Costs	224	224	202	271	212	245	224	246	251	269
E. Total Production Costs	841	743	783	870	715	771	805	853	906	946
F. Net Returns to:										
Capital (A – B)	232	191	186	322	133	426	365	364	486	484
Unpaid Labour (A – E + Unpaid Labour)	85	23	46	113	(18)	225	177	161	287	267
Investment (A – E + Paid Capital Interest)	36	(3)	19	80	(44)	206	153	151	259	238
Equity (A – E)	8	(33)	(16)	50	(78)	181	136	118	235	215

Figure 9



SECTION VII

SUMMARY

A summary of the 2007 sugar beets production costs and returns is presented in Table 10. As mentioned earlier, the sample size of 17 sugar beet producers (44 fields) for the 2007 beets crop was divided into two groups, i.e., beets produced on owned (27 fields) and rented land (17 fields). This was the smallest sample size of beet producers participating in the cost of production study since its inception in the early sixties. It was primarily due to significant decrease in area contracted for the 2008 beet crop.

Average gross returns based on crop sales, miscellaneous receipts and government program payment for the entire study sample amounted to \$1,162 per acre (\$44.37 per tonne) for the 2007 sugar beet crop. For beets produced on owned and rented land, gross returns were \$1,162 per acre (\$45.17 per tonne) and \$1,161 per acre (\$43.59 per tonne), respectively.

Average seed, fertilizer and chemical costs for sugar beet production in 2007 were estimated at \$195 per acre (\$7.46 per tonne) for the study sample. These costs were \$195 per acre (\$7.56 per tonne) for beets grown on owned land compared to \$196 per acre (\$7.37 per tonne) for rented land. Miscellaneous costs (hail/crop insurance, utilities, other insurance, association fees and research levies) amounted to \$58 per acre (\$2.22 per tonne) for the study sample; \$56 per acre (\$2.19 per tonne) for beets produced on owned land and \$60 per acre (\$2.26 per tonne) on rented land. Fuel and repairs (machinery and building) amounted to \$180 per acre (\$6.87 per tonne) for the study sample in 2007. For beets grown on owned land fuel and repairs were estimated at \$185 per acre (\$7.19 per tonne) compared to \$175 per acre (\$6.57 per tonne) for beets produced on rented land. Trucking and marketing costs were calculated at \$131 per acre (\$4.99 per tonne) for the study sample, \$138 per acre (\$5.37 per tonne) for beets grown on owned land and \$123 per acre (\$4.63 per tonne) for beets grown on rented land. Average cost for custom work and specialized labour amounted to \$12 per acre (\$0.47 per tonne) for the study sample, and also \$10 per acre (\$0.39 per tonne) for the owned land and \$15 per acre (\$0.55 per tonne) for the rented land group.

Average operating interest paid per acre was \$5.63 per acre (\$0.21 per tonne), \$4.97 per acre (\$0.19 per tonne), and \$6.29 per acre (\$0.24 per tonne) for the study sample, owned land and rented land groups, respectively. Average labour cost (paid and unpaid) was \$95 per acre (\$3.64 per tonne) for the study sample. It was \$99 per acre (\$3.85 per tonne) for beets grown on owned land and \$91 per acre (\$3.42 per tonne) for rented land.

Average total variable cost for the 2007 sugar beet crop was estimated at \$678 per acre (\$25.88 per tonne) for the study sample; \$688 per acre (\$26.74 per tonne) for the owned land group and \$667 per acre (\$25.03 per tonne) for beets produced on rented land. Average direct cash costs (total variable costs less unpaid labour) amounted to \$626 per acre (\$23.89 per tonne); \$636 per acre (\$24.69 per tonne); and \$616 per acre (\$23.11 per tonne) for the study sample; owned group and rented land group, respectively. Details on gross returns and various costs for the three groups, i.e. study sample, beets produced on owned and rented land are presented in Table 10.

Average capital costs were estimated at \$269 per acre (\$10.26 per tonne) for all of the study participants. These were \$242 per acre (\$9.42 per tonne) for the group who produced beets on owned land and \$295 per acre (\$11.08 per tonne) for beets grown on rented land.

Average total production costs for the 2007 sugar beet crop (variable costs + capital costs) amounted to \$946 per acre (\$36.14 per tonne) for the study sample. For beets grown on owned and rented land, average production costs per acre were at \$931 per acre (\$36.16 per tonne) and \$962 per acre (\$36.11 per tonne). Details on total production costs are presented in Table 10.

Average return to capital (contribution margin) for the study sample for the 2007 sugar beet crop was positive at \$484 per acre (\$18.49 per tonne). Similarly, average return to unpaid labour for the study sample was positive at \$267 per acre (\$10.21 per tonne). Returns to investment and equity for the study sample were also positive at \$238 per acre (\$9.11 per tonne)

and \$215 per acre (\$8.23 per tonne), respectively. Average return to capital for beets grown on owned land was \$474 per acre (\$18.42 per tonne) and \$494 per acre (\$18.55 per tonne) for beets grown on rented land. Return to unpaid labour for beets produced on owned land was positive at \$284 per acre (\$11.05 per tonne) compared with a return of \$250 per acre (\$9.59 per tonne) for beets produced on rented land. Return to investment for beets grown on owned land was also positive at \$266 per acre (\$10.33 per tonne). Return to equity was positive as well for beets grown on owned land at \$232 per acre (\$9.09 per tonne). Returns to unpaid labour, investment and equity were all positive for beets grown on rented land. Average return to investment for beets grown on rented land was \$211 per acre (\$7.90 per tonne). Similarly return to equity for this group of beet producers was also positive at \$199 per acre (\$7.47 per tonne). Details on gross returns, major costs and net returns are presented in Table 10.

Table 10: Summary of Sugar Beet Production Costs and Returns, 2007

	Study Sample		Owned Land		Rented Land	
	\$/acre	\$/tonne	\$/acre	\$/tonne	\$/acre	\$/tonne
	---	---	---	---	---	---
Acres Cropped	95.15		78.13		122.18	
Yield Per Acre (tonnes)	26.19		25.74		26.65	
A. GROSS RETURNS	1,161.91	44.37	1,162.47	45.19	1,161.34	43.59
VARIABLE COSTS						
Seed, Fertilizer & Chemicals	195.48	7.46	194.63	7.56	196.35	7.37
Miscellaneous*	58.27	2.22	56.29	2.19	60.28	2.26
Fuel and Repairs (Mach. & Bldg.)	179.99	6.87	184.95	7.19	174.97	6.57
Trucking and Marketing	130.80	4.99	138.12	5.37	123.36	4.63
Custom Work & Specialized Labour	12.34	0.47	10.14	0.39	14.56	0.55
Operating Interest	5.63	0.21	4.97	0.19	6.29	0.24
Labour (Paid & Unpaid)	95.24	3.64	99.18	3.85	91.25	3.42
B. TOTAL VARIABLE COSTS	677.75	25.88	688.28	26.74	667.06	25.03
C. CASH COSTS (B - Unpaid Labour)	625.76	23.89	635.53	24.69	615.83	23.11
D. CAPITAL COSTS	268.68	10.26	242.44	9.42	295.34	11.08
F. TOTAL PRODUCTION COSTS (B+D)	946.43	36.14	930.71	36.16	962.40	36.11
F. NET RETURNS						
Return to Capital (Contribution Margin)	484.16	18.49	474.19	18.42	494.28	18.55
Return to Unpaid Labour	267.47	10.21	284.50	11.05	250.18	9.39
Return to Investment	238.48	9.11	265.91	10.33	210.62	7.90
Return to Equity	215.48	8.23	231.76	9.09	198.95	7.47

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

APPENDIX

SUGAR BEET PRODUCTION COSTS AND RETURNS USING PROVINCIAL YIELD, 2007

Sugar beet production costs and returns data presented in Table 11 are based on a provincial average yield of 25.06 tonnes in 2007. As mentioned at the beginning of the report, average yield for the study sample of 17 beet producers was estimated at 26.19 tonnes per acre. It was higher by 1.13 tonne than the industry average yield mentioned above.

Assuming other receipts (crop insurance and miscellaneous) were the same for sugar beet growers for the 2007 beet crop, total gross revenue was calculated to be \$1,131 per acre or (\$44.42 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 observe how the net returns could be impacted if industry average yield was used to arrive at sugar beet production costs and returns.

Average return to capital was positive at \$453 per acre (\$18.09 per tonne) with the provincial yield compared with \$484 per acre (\$18.49 per tonne) for the study sample. Return to unpaid labour was positive with the provincial yield at \$237 per acre or (\$9.45) per tonne whereas for the study sample it was \$267 per acre (\$10.21 per tonne). Returns to investment and equity were also positive with the provincial yield at \$208 per acre (\$8.29 per tonne) and \$185 per acre (\$7.37 per tonne), respectively. Similarly, returns to investment and equity for the study sample of 17 beet producers were also positive at \$238 per acre (\$9.11 per tonne) and \$215 per acre (\$8.23 per tonne), respectively. Details on gross revenue, costs and returns with the provincial average yield of 25.06 tonnes per acre for the 2007 beet crop are presented in Table 11.

Table 11: Sugar Beet Production Costs and Returns Based on Provincial Yield, 2007			
Acres Cropped	95.15	\$ per acre	\$ per tonne
Yield Per Acre	25.06 tonnes		
GROSS RETURNS			
Crop Sales		1,083.59	43.24
Crop Insurance Receipts		20.72	
Miscellaneous Receipts		8.87	
A. TOTAL GROSS RETURNS		1,131.18	44.42
VARIABLE COSTS			
Seed		53.98	
Fertilizer		54.54	
Chemicals		86.96	
Hail/Crop Insurance		28.24	
Machine Fuel (Net of Rebate)		72.71	
Irrigation Fuel		39.12	
Repairs - Machinery		61.64	
Repairs - Buildings		6.52	
Utilities, Insurance & Overhead		18.85	
Association Fees & Research Levies		11.17	
Custom Work and Specialized Labour		12.34	
Trucking and Marketing		130.80	
Operating Interest Paid		5.63	
Paid Labour		43.25	
Unpaid Family & Operator Labour		51.99	
B. TOTAL VARIABLE COSTS		677.75	32.01
C. DIRECT CASH COSTS (Total Variable Costs - Unpaid Labour)		625.76	29.56
CAPITAL COSTS			
Cash Rent/Crop Share		85.59	
Taxes, Water Rates & Insurance		27.30	
Equipment/Building Depreciation		112.92	
Lease Payment		19.87	
Paid Capital Interest		23.00	
D. TOTAL CAPITAL COSTS		268.68	12.69
E. TOTAL PRODUCTION COSTS (B+D)		946.43	44.71
F. NET RETURNS			
Return to Capital (A-B)		453.43	18.09
Return to Unpaid Labour (A-E + Unpaid Operator Labour)		236.74	9.45
Return to Investment (A-E + Paid Capital Interest)		207.75	8.29
Return to Equity (A-E)		184.75	7.37
INVESTMENT			
Land & Buildings		1,770.61	
Machinery		1,169.32	

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