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Economics of Beekeeping in Alberta 2016



Alberta
Government

AGDEX 821-62

December, 2017

ECONOMICS OF BEEKEEPING

IN ALBERTA

2016

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Economics Section
Economics and Competitiveness Branch
Alberta Agriculture and Forestry

December 2017

Published by:

Alberta Agriculture and Forestry
Economics and Competitiveness Branch
Economics Section
7000 - 113 Street
Edmonton, Alberta. T6H 5T6
Canada

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ISSN 2291-7004 (Print)

ISSN 2291-6997 (Online)

ACKNOWLEDGEMENTS

I wish to express my sincere thanks and appreciation to the beekeepers across the province for their cooperation and willingness in providing the necessary data for this study. Without their participation, publication of this report would not have been possible.

As well, I wish to gratefully acknowledge and thank several staff members of AF, including Pauline VanBiert, Shukun Guan, Lorraine Kohlman and Dr. Medhat Nasr for their contributions to this report.

The data collection was sponsored by Growing Forward 2, a federal-provincial-territorial initiative.

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EXECUTIVE SUMMARY

Costs and returns for beekeeping in Alberta have been monitored by the Economics Section of Alberta Agriculture and Forestry since the early 1970s. In winter 2016-17, about 47 beekeepers across the province were surveyed personally to obtain their 2016 costs and returns information. Thirty two (32) out of these 47 beekeepers produced only honey, eight (8) rented their hives for pollination and extracted honey also and the remaining seven (7) primarily produced honey and sold bees as queens, bee nucs and hives. The largest beekeeper operated 8,000 hives and the smallest beekeeper had five hives. These 47 beekeepers managed 62,912 hives, representing 20 percent of the total number of hives in the province in 2016.

This report provides details on total value of production (bulk honey sales, other honey sales and inventory and miscellaneous income) for the three beekeeping enterprise activities (honey production, pollination and bee sales). It also provides estimates of cash costs, operator and family labour, capital costs and net returns (management indicators). The report also contain historical data and trends on the number of beekeepers, number of colonies, colonies per beekeeper, production, honey price and farm cash receipts in Alberta and Canada from 1985 to 2016. In addition, it provides statistics on honey and bee exports and imports.

The report shows a comparison of honey costs and returns for Alberta as well as by region and by size of operation. The results show that beekeepers that kept less than 100 hives achieved the highest return to equity in comparison to other groups. This could be explained by their high value of production due to direct market sales of honey. The multiple regression coefficients show that a one percent increase in total variable costs and total capital costs will correspondingly increase the total value of production of these honey producers by 0.71 percent and 0.35 percent respectively. Sugar feeding costs, total labour costs and number of hives were found to have no statistically significant impact on the total value of production of honey producers.

Those who provided pollination services had comparable costs and made slightly more money than those who produced only honey. Similarly, the bee sales group made more money compared with those who produced only honey. The information presented in the report can be used for several purposes including program evaluation and policy development for the beekeeping industry in Alberta. It could also serve as a guide to producers.

SECTION I

INTRODUCTION

Costs and returns for livestock, crops and several other enterprises have been monitored 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 and the federal and provincial governments in developing policies and programs for the different farm enterprises. Where information gaps existed in other provinces, results from these studies have served as the basis to fill those gaps.

The beekeeping sector is a vital component of the agricultural industry in Alberta. The major enterprises of the beekeeping industry in Alberta are honey production and pollination. A business analysis of beekeeping operations in 2016 across the province shows that a third enterprise - selling of bees (queens, bee nucs and hives) is emerging. Preliminary estimates for 2017 show that Alberta beekeepers manage 315,000 honey bee colonies, which accounts for 43 per cent of the total number of Canadian honey bee colonies. Approximately 85 percent of bee colonies are in commercial operations. About 75,000 bee colonies are annually rented for pollinating pedigreed hybrid canola seed to ensure high yield of canola seed for farmers.

This report provides detailed information on the economics of beekeeping in the province during the 2016 production year. The 2016 costs and return study is a continuing effort to monitor economics of beekeeping in the province which has been done periodically by the Economics Section of Alberta Agriculture and Forestry since the early 1970s. The last cost of production survey was completed in 2013 with 2011 data. Information presented in this report can be used for several purposes including preparation of feasibility studies, program evaluation and policy development for the beekeeping industry in Alberta. It would also assist individual study participants to compare their costs and returns with the group averages to better develop/manage their operations.

Objectives of the Study

Following are the objectives of this study:

1. To determine production costs and returns associated with beekeeping in Alberta.

2. To establish physical input/output relationships for beekeeping in Alberta.
3. To provide each study participant with a detailed analysis of his/her beekeeping operation and opportunity to compare the operation with the group averages.
4. To observe regional differences in costs and returns for beekeeping operations across the province.
5. To document how variation in size of operation affects net returns.
6. To provide an up-to-date economic report on beekeeping in Alberta to assist governments in developing programs and policies for this industry.

The Study Sample

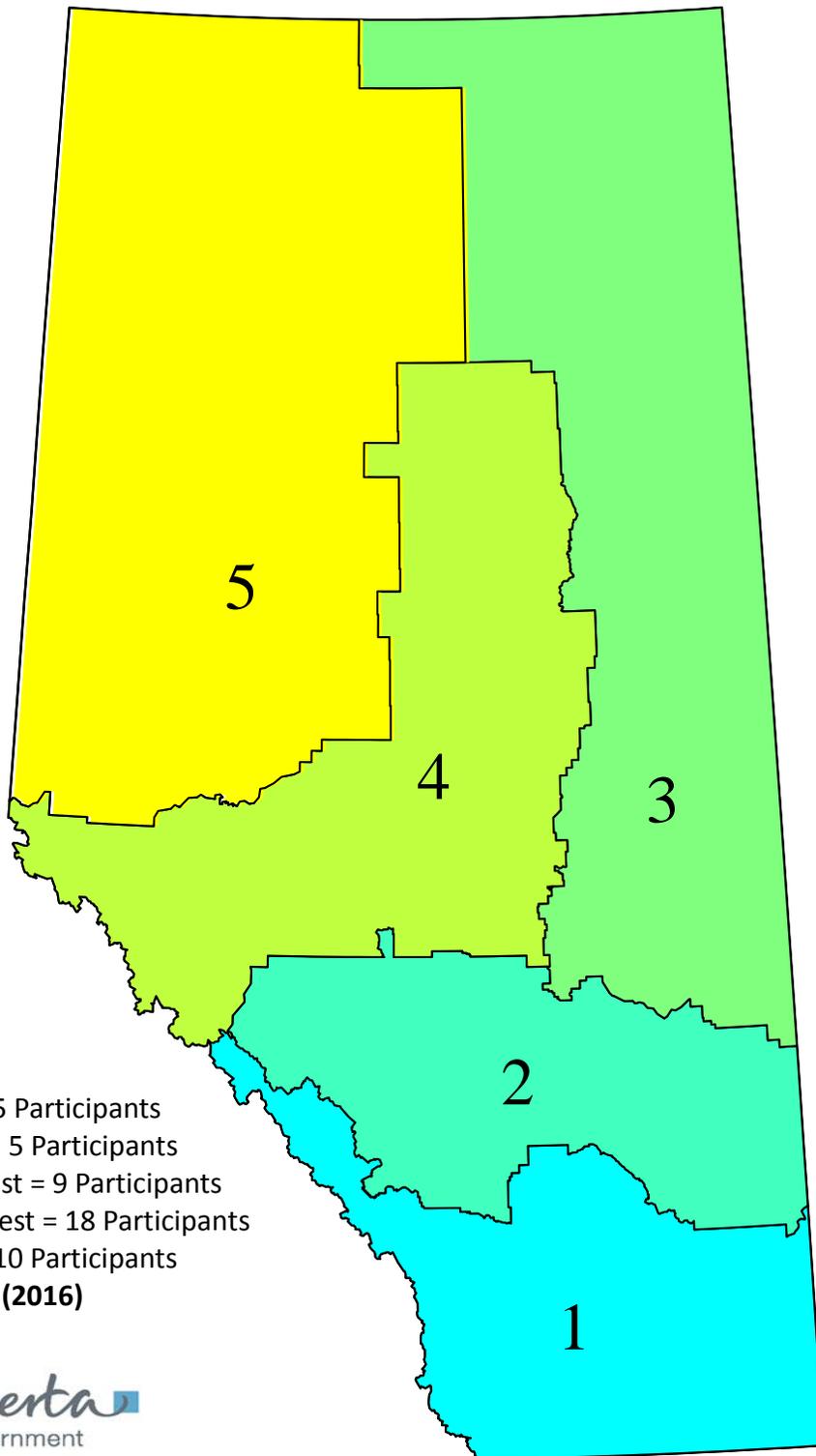
The sample for the 2016 study was randomly selected from the list of registered beekeepers in Alberta. The random selection of the sample ensured a representative cross section of producers in the province. Following the selection, copies of the questionnaire together with recruitment letters were mailed to all the selected beekeepers after which individual phone calls were made to confirm their willingness to participate in the study.

About 50 beekeepers across the province agreed to be surveyed personally to obtain their detailed costs and returns information for the 2016 production season. In total, 47 beekeepers completed the questionnaires. Thirty two (32) out of the 47 beekeepers produced only honey, eight (8) rented their hives for pollination and extracted honey also and the remaining seven (7) primarily produced honey and sold bees. Table 1 shows the regional breakdown of these 47 beekeepers. Figure 1 shows the distribution of the study sample by region.

Table 1: Breakdown of Study Sample by Region

REGION	NUMBER OF PARTICIPANTS	NUMBER OF COLONIES			
		Average	Minimum	Maximum	Total
South	5	780	52	2,400	3,902
Central	5	1,802	50	4,600	9,010
North-East	9	1,949	5	8,000	17,542
North-West	18	1,134	11	7,000	20,410
Peace River	10	1,205	60	4,400	12,048
TOTAL	47	1,339	5	8,000	62,912

Figure 1: Distribution of Study Participants by Region



- 1. South = 5 Participants
 - 2. Central = 5 Participants
 - 3. North-East = 9 Participants
 - 4. North-West = 18 Participants
 - 5. Peace = 10 Participants
- AF Regions (2016)**



In total, these 47 participants or beekeepers managed approximately 62,912 hives. This represents approximately 20 percent of the total number of hives in the province in 2016. The largest beekeeper in the study sample operated approximately 8,000 hives and the smallest beekeeper had five hives. Table 2 shows the breakdown of the entire study sample by size of operation.

Table 2: Breakdown of Study Sample by Size of Beekeeping Operation

SIZE OF OPERATION	NUMBER OF PARTICIPANTS	AVERAGE NUMBER OF HIVES PER BEEKEEPER
Over 1,000 hives	15	3,554
Up to 1,000 hives	32	300
400 - 1000 hives	10	601
100 - 399 hives	11	282
5 - 99 hives	11	44
TOTAL	47	1,339

The study sample was further classified according to the various enterprise types. Table 3 shows the classification of beekeeping enterprise by region and by size of operation.

Table 3: Classification of Beekeeping Enterprise by Region and Size of Operation

	BEEKEEPING ENTERPRISE ACTIVITY					
	HONEY		POLLINATION		BEE SALES	
	Number of Participants	Average Number of Hives	Number of Participants	Average Number of Hives	Number of Participants	Average Number of Hives
BY REGION						
GROUP I - South and Central	5	227	4	N/A	1	N/A
GROUP II - North-East	7	1342	1	N/A	1	N/A
GROUP III - North-West	13	767	1	N/A	4	N/A
GROUP IV - Peace River	7	357	2	N/A	1	N/A
Total	32	719	8	3157	7	2094
BY SIZE OF OPERATION						
GROUP V - Up to 1,000 hives	26	286	2	N/A	4	1,977
GROUP VI - 400 - 1,000 hives	7	584	1	N/A	2	N/A
GROUP VII - 100-399 hives	10	296	N/A	N/A	1	N/A
GROUP VIII - Less than 100 hives	9	44	1	N/A	1	N/A
GROUP IX - More than 1,000 hives	6	2,594	5	4,600	3	N/A
Total	32	719	8	3,157	7	2,094

N/A = Not Available. Data not published to maintain confidentiality.

The 47 beekeepers who participated in the study produced approximately 11.25 million pounds of honey or 30 percent of the 2016 provincial total of 38.13 million pounds.

Method of Analysis

The raw data obtained from the 47 beekeepers across the province was reviewed for information gaps before entering into the computer for analysis. Individual analyses, provincial and group averages (by region and size of operation) were developed using the Paradox program. Individual analyses were mailed to study participants for their review and feedback before finalizing the group averages for this report. The terminologies used in the report are defined as follows:

Total Value of Honey:

This refers to the value of honey produced over the course of the production year. Total value of honey is based on:

- Bulk honey sales
- Bulk honey inventory
- Consumer pack sales
- Consumer pack inventory, and
- Other honey sales.

Total Value of Production:

In addition to total value of honey, total value of production includes:

- Wax sales
- Pollen sales
- Crop insurance receipts
- Miscellaneous income (any program payments)
- Honey purchase for resale, and
- Hive rental - pollination.

The study participants were asked to provide actual sales and an estimate of expected price for any 2016 honey held in inventory and/or any other stock.

Variable Costs:

Most of the inputs used in honey production were purchased during the production year and recorded as such in the year-end statement. The study participants were asked to provide estimates

for those costs for which actual records were not available, i.e., any inventory carried from last year. In 2016, the average hourly wage for hired labour was the actual wage reported by the study participant. Operating interest was the actual amount paid by the study participant. Operators and family labour under 16 years (unpaid labour) were valued at \$21 and \$15 per hour, respectively. The study participants were asked to provide estimates of hours spent on the honey operation by their family member(s) and themselves.

Capital Costs:

Capital costs include land rent/lease, building rent and forage access, bee equipment, and vehicles, etc. Capital interest was the actual amount paid by the study participants for capital purchases.

Cash Costs:

Cash costs represent all out-of-pocket costs incurred during the production period and marketing of honey. It does not include costs associated with operators and family labour and depreciation for buildings and equipment.

Total Production Costs:

Total production costs comprise of variable costs and capital costs.

Management Indicators:

Management indicators presented at the bottom of various tables show gross margin, return to unpaid labour, investment and equity. These indicators provide profit margins and economic viability of production at the provincial level by regions and by size of operations.

- Gross margin - gross revenue less cash costs.
- Return to unpaid labour - gross revenue less total production costs plus unpaid labour.
- Return to Investment - gross revenue less total production costs plus capital interest.
- Return to Equity - gross revenue less total production costs.

SECTION II

BEEKEEPING INDUSTRY STATISTICS IN ALBERTA

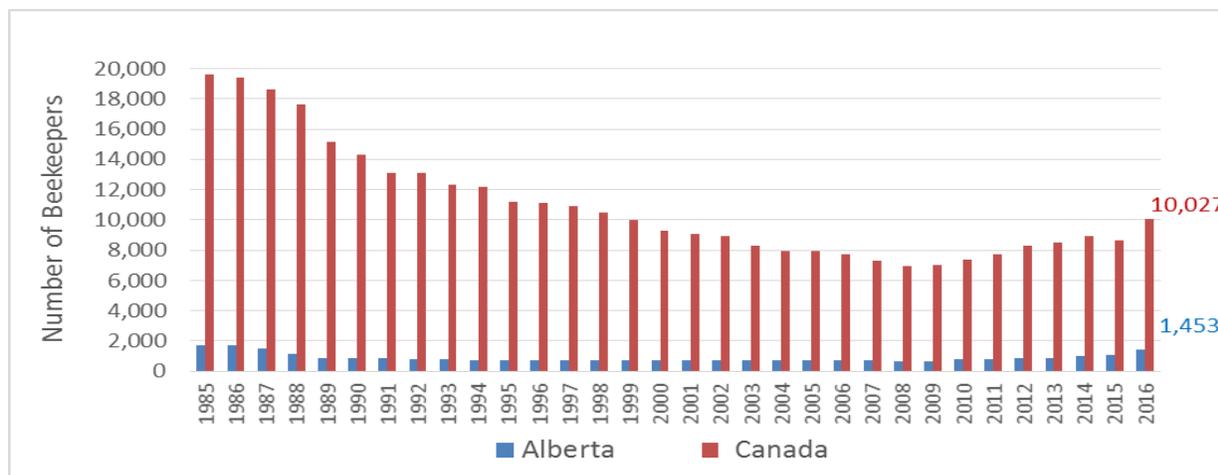
Alberta is the largest honey producing province in Canada. Over the last several years, the provincial beekeeping industry moved from being only honey production to providing pollination services and now a third enterprise - selling bees (queens, bee nuclei and hives) is emerging. Beekeepers from various regions across the province who provide pollination services move their bees to either southern Alberta for hybrid canola seed production or to British Columbia for pollinating blueberries, daisies, etc.

Table 4 shows historical data on the number of beekeepers, number of colonies, colonies per beekeeper, production, honey price and farm cash receipts in Alberta from 1985 to 2016. Included in Table 4, is percentage change from 2011 to 2016 as well as a compound annual growth rate which shows the year-over-year growth rate observed in the industry from 2011 to 2016. Since the current and previous costs of production studies were completed with 2016 and 2011 data respectively, these percentages provide an idea of how the industry has generally performed.

Number of Beekeepers

The number of beekeepers in Alberta and Canada has varied considerably over the past 31 years. In 2016, Alberta had 1,453 registered beekeepers, up 37 percent from the 1,064 beekeepers registered in 2015. Alberta accounted for 14 percent of the number of beekeepers in Canada in 2016. Figure 2 shows trends in the number of beekeepers in Alberta and Canada from 1985 to 2016.

Figure 2: Number of Beekeepers in Alberta and Canada, 1985-2016



Source: Statistics Canada, Alberta Agriculture and Forestry

Table 4: Historical Data on Honey Production in Alberta, 1985 - 2016

Year	Number of Beekeepers	Number of Colonies	Colonies Per Beekeeper	Average Yield Per Colony (lb.)	Honey Production (lb.)	Price Per Pound (cents)	Honey Farm Cash Receipts (dollars x 1,000)
1985	1,700	181,000	106	102	18,462,000	56	\$11,906
1986	1,700	190,000	112	126	23,940,000	60	\$12,982
1987	1,480	193,000	130	132	25,476,000	42	\$12,502
1988	1,140	150,000	132	153	22,950,000	40	\$10,139
1989	855	143,500	168	120	17,220,000	49	\$9,001
1990	840	152,000	181	153	23,256,000	58	\$11,666
1991	830	147,000	177	143	21,021,000	58	\$11,666
1992	800	148,000	185	156	23,088,000	59	\$13,001
1993	761	148,000	194	160	23,680,000	69	\$13,352
1994	750	159,000	212	195	31,005,000	68	\$15,609
1995	750	175,000	233	122	21,350,000	83	\$19,689
1996	750	175,000	233	116	20,300,000	125	\$19,693
1997	725	175,000	241	135	23,625,000	110	\$22,857
1998	730	205,000	281	187	38,335,000	89	\$30,734
1999	725	205,000	283	121	24,805,000	81	\$25,832
2000	747	217,000	290	111	24,087,000	83	\$19,911
2001	739	227,000	307	118	26,786,000	103	\$24,312
2002	702	227,000	323	131	29,737,000	198	\$45,679
2003	754	221,000	293	126	27,846,000	204	\$57,450
2004	693	248,000	358	135	33,480,000	176	\$53,075
2005	728	251,000	345	127	31,877,000	99	\$39,229
2006	733	254,000	347	184	46,736,000	96	\$40,247
2007	726	237,000	326	122	28,914,000	98	\$36,494
2008	620	226,000	365	115	25,990,000	151	\$34,423
2009	683	251,000	367	116	29,116,000	168	\$44,293
2010	769	266,000	346	130	34,580,000	163	\$53,199
2011	798	274,600	344	124	34,050,400	174	\$57,963
2012	883	278,400	315	136	38,000,000	180	\$64,579
2013	890	278,100	312	119	33,200,000	220	\$71,033
2014	1,015	282,900	279	125	35,500,000	225	\$76,966
2015	1,064	296,880	279	133	39,461,000	214	\$82,601
2016	1,453	309,000	213	130	40,170,000	155	\$68,214
<i>5-yr average (2012-2016)</i>	<i>1,061</i>	<i>289,056</i>	<i>280</i>	<i>129</i>	<i>37,266,000</i>	<i>199</i>	<i>\$72,679</i>
<i>% Change 2011-2016*</i>	<i>82%</i>	<i>13%</i>	<i>-38%</i>	<i>5%</i>	<i>18%</i>	<i>-11%</i>	<i>18%</i>
<i>% CAGR**</i>	<i>10.5%</i>	<i>2.0%</i>	<i>-7.7%</i>	<i>0.8%</i>	<i>2.8%</i>	<i>-1.9%</i>	<i>2.8%</i>

Source: Statistics Canada, Alberta Agriculture and Forestry

% Change 2011-2016* = 2016/2011 Percentage Change

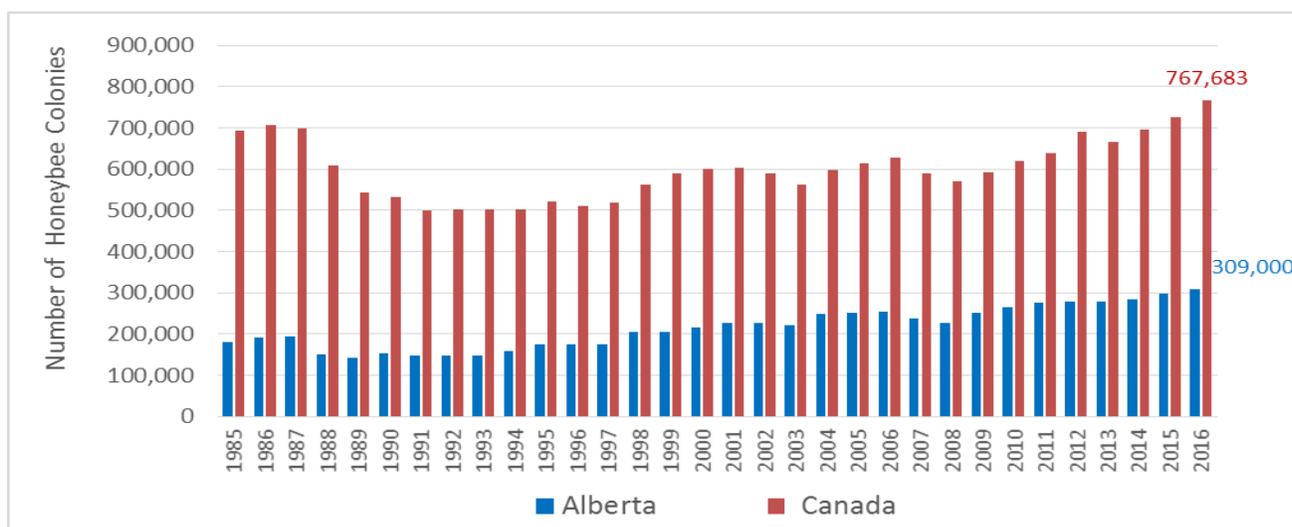
% CAGR** = 2011-2016 Compound Annual Growth Rate

As shown in Figure 2, the number of beekeepers in Alberta has been rising steadily since 2008. This is due in part to a significant increase in the number of hobby beekeepers especially in urban districts. Compared to 2011, the number of beekeepers in 2016 increased by 82 percent in Alberta. This translates to a compound annual growth rate of 10.5 percent.

Number of Colonies

While Alberta accounts for a relatively small percentage of the nation’s total beekeepers, it had about 40 percent of honey producing colonies in 2016. About 115 commercial beekeepers having 400 or more hives account for about 92.5 percent of the total bee colonies in Alberta. Figure 3 shows trends in the number of honeybee colonies in Alberta and Canada from 1985 to 2016.

Figure 3: Number of Honeybee Colonies in Alberta and Canada, 1985-2016



Source: Statistics Canada, Alberta Agriculture and Forestry

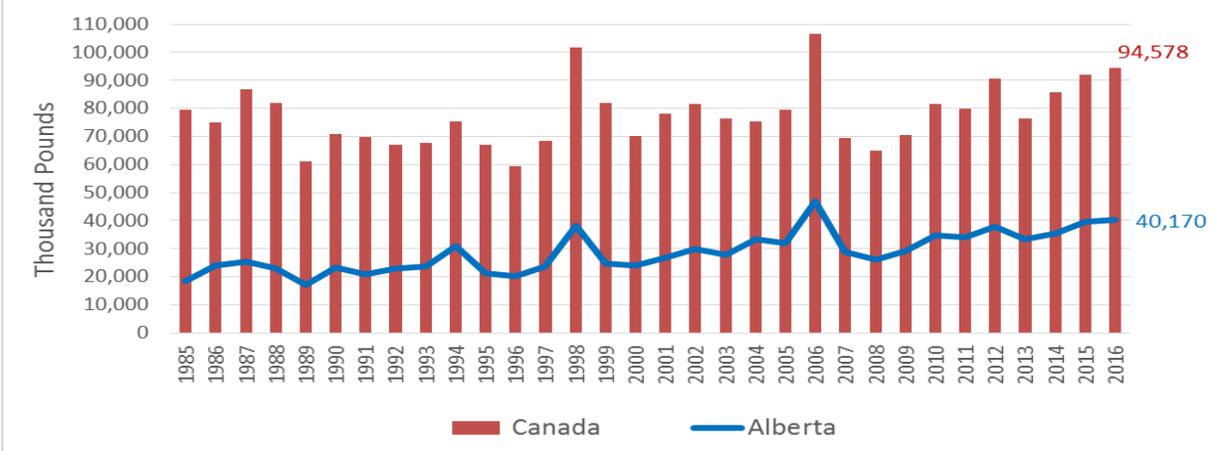
In 2016, the number of honeybee colonies in Alberta increased 13 percent compared to 2011. This translates to a compound annual growth rate of 2.0 percent (Table 4).

Honey Production

Honey production has also varied considerably in the province over the past 31 years. In 2016, honey production in Alberta totaled 40.17 million pounds, up two percent from the 2015 value of approximately 39.46 million pounds. Alberta’s honey production in 2016 accounted for about 42 percent of honey production in Canada. During the past five years (2012 to 2016) honey production averaged 37.27 million pounds.

Compared to 2011, Alberta’s honey production in 2016, increased approximately 18 percent. This translates to a compound annual growth rate of 2.8 percent (Table 4). Figure 4 shows trends in honey production in Alberta and Canada from 1985 to 2016.

Figure 4: Honey Production in Alberta and Canada, 1985-2016 (Pounds x 1,000)



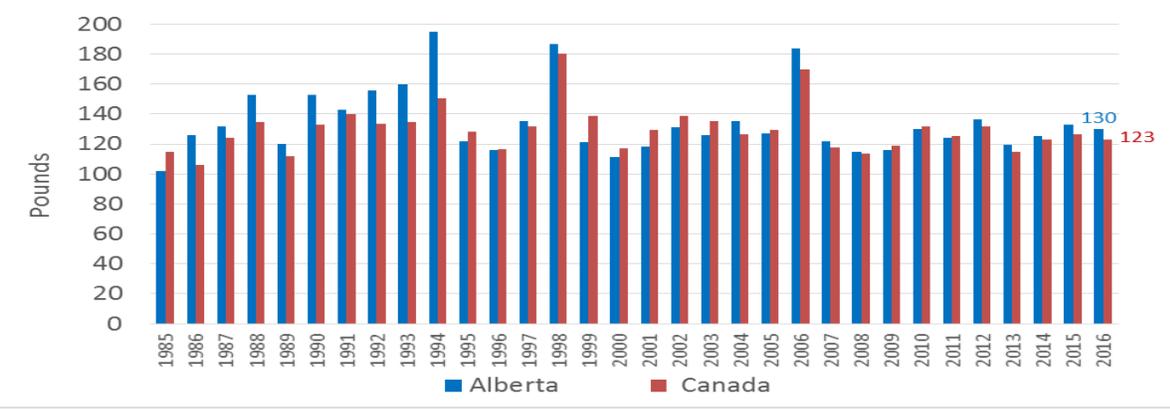
Source: Statistics Canada, Alberta Agriculture and Forestry

The highest honey production was recorded in 2006. This was followed by two consecutive years of decline in 2007 and 2008 due to high winterkill of bee colonies. Since 2008, honey production has generally seen an increasing trend as the number of bee colonies increased.

Average Yield per Colony

In 2016, average yield per colony in Alberta was 130 pounds, seven pounds higher than Canada’s average of 123 pounds. Figure 5 show the trends in average yield per colony over the period 1985 to 2016 in Alberta and Canada.

Figure 5: Average Yield per Colony in Alberta and Canada, 1985-2016 (Pounds)



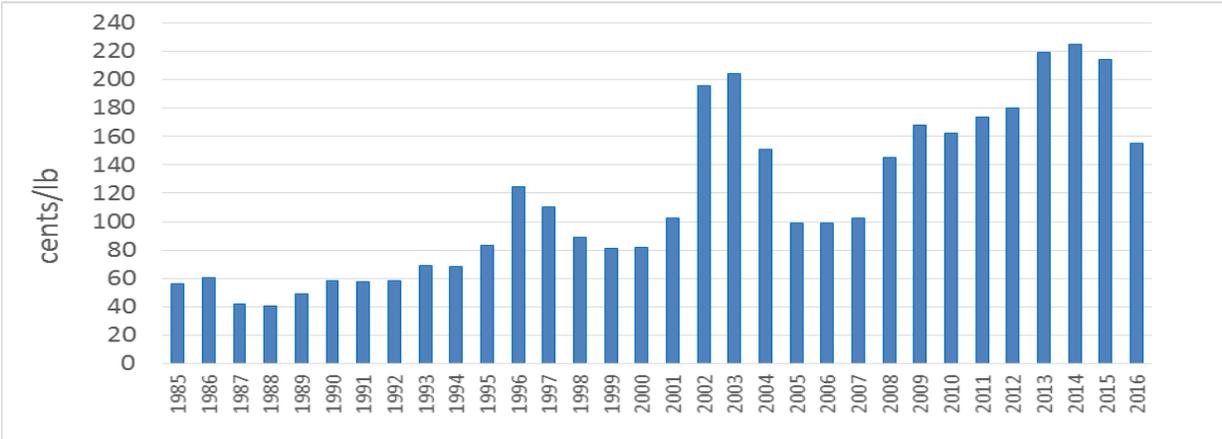
Source: Statistics Canada, Alberta Agriculture and Forestry

Yield per colony has varied annually over the last 31 years in Alberta. It ranged from 102 pounds in 1985 to 195 pounds in 1994. During the past five years (2012 to 2016) production per colony has averaged 129 pounds.

Honey Prices

Producer prices received per pound of honey has varied annually over the last 31 years in Alberta. In 2016, the average price of honey including retail was \$1.55 per pound. Figure 6 shows the trend in Alberta honey prices from 1985 to 2016.

Figure 6: Honey Price in Alberta, 1985-2016 (cents per pound)



Source: Statistics Canada, Alberta Agriculture and Forestry

The highest price of \$2.25 per pound was recorded in 2014. During the past five years (2012 to 2016) the price of honey averaged \$1.99 per pound. Honey prices in 2016 decreased approximately 11 percent and 28 percent when compared to the price in 2011 and 2015 respectively. Currently, the price of honey is around \$1.60 per pound, an increase of about three percent compared to the 2016 average price.

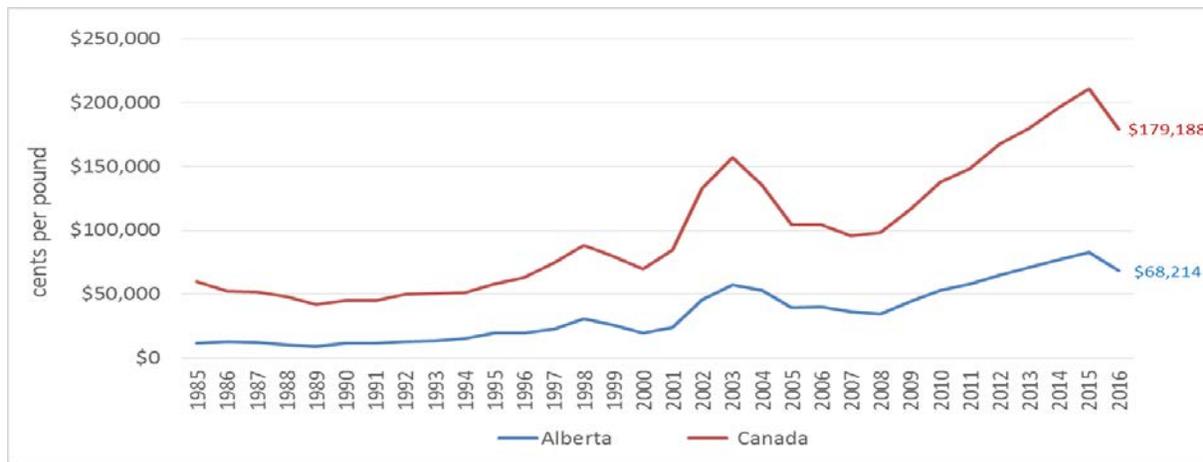
Honey Farm Cash Receipts

Alberta farm cash receipts from honey produced in 2016 totaled \$68.2 million, down 17 percent from the record high of \$82.6 million set in 2015. In 2016, Alberta accounted for 38 percent of Canadian honey market receipts. As shown in Table 4, Alberta’s honey market receipts averaged \$72.7 million during the past five years (2012-2016).

In 2016, despite a 17 percent decline from 2015, Alberta’s honey market receipts increased approximately 18 percent when compared to the price in 2011. This translates to a compound annual

growth rate of 2.8 percent (Table 4). Figure 7 shows the trend in Alberta and Canada honey farm cash receipts from 1985 to 2016.

Figure 7: Honey Farm Cash Receipts in Alberta and Canada, 1985-2016



Source: Statistics Canada, Alberta Agriculture and Forestry

Honey and Bee Exports and Imports

In 2016, Alberta held approximately 46 percent of Canadian export share for honey, exporting approximately \$33.14 million of the national total of \$71.54 million. Alberta's honey exports in 2016 increased by approximately 62 percent relative to 2015. About 99.5 percent of the honey was exported to three key destinations namely United States, Japan, and China. The US comprised 69.1 percent of the total value followed by Japan at 29.8 percent and China at 0.6 percent.

Honey, live queens, bee packages and bee nucs are other key products that are imported into Alberta. In 2016, Alberta imported approximately 224 tonnes of honey (493,755 pounds) valued at \$1,165,645. This translates to approximately two percent of Alberta's farm cash receipts generated from the sale of honey. Alberta held approximately 55.0 percent of the Canadian import share for live queen bees, importing approximately \$3.7 million of the national total of \$6.6 million in 2016. Nearly all Alberta imports of live queen bees in 2016 were from the US (99.8 percent) and the remaining were from Chile. Hawaii continues to be the primary source, accounting for about 57 percent of the US total while the other States accounted for the remaining 43 percent. Almost 100 percent of bee packages are imported. New Zealand accounted for about 100 percent of bee packages imported into Canada in 2016. Survey of Alberta Beekeepers in 2016 shows that about 87 percent of bee nuc purchases were from British Columbia and the remaining 13 percent were from Alberta.

SECTION III

HONEY PRODUCTION COSTS AND RETURNS IN ALBERTA, 2016

The results in Table 5 are based on data provided by 32 honey producers across the province. In 2016, honey produced for sale by an average study participant was 137,304 pounds, of which 119,949 pounds (87 percent) were sold as bulk honey. Bulk honey inventory was estimated at 9,346 pounds (seven percent); consumer pack sales at 5,204 pounds (four percent) and consumer pack inventory at 2,789 pounds (two percent).

The average number of hives per study participant was 719. The average yield per hive was estimated at 191 pounds. The average honey production per hive for this group of beekeepers was higher by 66 pounds compared to the provincial average of 125 pounds shown in Table 1. Readers or users of this report are to note that production per hive is difficult to compare. Therefore producers are interested in knowing their income and cost of production based on units of production expressed as value per one pound of honey produced. Details on honey, wax and pollen sales and other income are presented in Table 5.

Total value of honey produced (bulk honey sales, inventory, consumer pack sales, consumer pack inventory, other honey sales) per study participant amounted to \$201,452 in 2016. This translates to an average value per hive of \$280 or \$1.47 per pound of honey produced. When wax/pollen sales, crop insurance and other miscellaneous receipts were included to the value of honey, the total value of production (A) increased to about \$210,625 or \$293 per hive (\$1.53 per pound of honey produced). As shown in Table 4, honey prices in 2016 declined by approximately 30 percent compared to the price in 2015 and by 26 percent compared to the previous five year average (2011-2015). As of the time of completing this report, the price of honey is around \$1.60 per pound, an increase of about seven percent compared to the 2016 average price.

Variable Costs:

Variable costs (B) were estimated at \$123,740 per average study participant in 2016. In terms of variable costs per hive, the average amount was \$172 per hive (\$0.90 per pound of honey produced). Due to the producers' interest in knowing their variable costs for each basic unit of production, these costs were broken into as much detail as possible. The most significant inputs that made up major

portions of variable costs were labour followed by expenses associated with sugar for feeding, bee purchases, machine and building repairs and medicinal sugar/bee repellent.

Capital Costs:

Capital costs (C) are comprised of land rent/lease, building rent and forage access, taxes, licenses and general insurance, depreciation for buildings, bee equipment and vehicles, lease payments and capital interest paid. Average total capital cost amounted to \$54,298 or \$76 per hive or \$0.40 per pound of honey produced.

Cash Costs:

Cash costs (D) include all out of pocket costs incurred during the honey production period. These costs amounted to \$118,942 per average beekeeper in the study for the 2016 honey production. In terms of average cash costs per hive, the amount was \$165 or \$0.87 per pound of honey produced.

Total Production Costs:

Details on total production cost for an average study participant are presented in Table 5. Average total production cost (E) was estimated at \$178,037 for an average honey operation with 719 hives. Average production cost was estimated at \$248 per hive or \$1.30 per pound of honey produced.

Management Indicators:

When cash costs were deducted from the total value of honey production (A-D), the average study participant showed a positive gross margin of \$91,683 per beekeeping operation. Gross margin per hive was \$128 or \$0.67 per pound of honey produced. Average return to unpaid labour in 2016 was positive at \$48,308 per study participant. In terms of return to unpaid labour per hive, it amounted to \$67 or \$0.35 per pound of honey produced. Average return to investment was estimated at \$34,226 per operation or \$48 per hive (\$0.25 per pound of honey produced). Return to equity per hive was \$32,588 per average beekeeper or \$45 per hive (\$0.24 per pound of honey produced).

Table 5: Honey Production Costs and Returns, Alberta, 2016

(A)			Total \$	\$/Hive	\$/lb
1. Bulk Honey Sales	119,949.19	lbs	165,396.81	230.11	1.38
2. Bulk Honey Inventory	9,346.16	lbs	12,929.69	17.99	
3. Consumer Pack Sales	5,204.13	lbs	18,639.56	25.93	
4. Consumer Pack Inventory	2,788.94	lbs	4,464.15	6.21	
5. Other Honey Sales	15.63	lbs	21.56	0.03	
6. Wax/Pollen/Other Sales	1,629.81	lbs	6,959.63	9.68	
7. Bee Sales			210.94	0.29	
8. Bee/Honey Insurance Receipts			1,542.16	2.15	
9. Miscellaneous Receipts			460.45	0.64	
10. Less: Honey Purchase for Resale			0.00	0.00	
VALUE OF PRODUCTION			210,624.95	293.03	1.53
(B)					
1. Bee Purchases - Package Bees			777.34	1.08	
2. Bee Purchases - Queens			7,943.31	11.05	
3. Bee Purchases - Nucs			618.59	0.86	
4. Freight & Trucking			2,813.66	3.91	
5. Sugar for Feeding			15,126.94	21.05	
6. Pollen Supplement Feeding			812.44	1.13	
7. Medicinal Sugar/Bee Repellent			7,720.69	10.74	
8. Bee/Honey Insurance			3,868.50	5.38	
9. Fuel			4,791.66	6.67	
10. Repairs - Machine			4,531.75	6.30	
11. Repairs - Buildings & Improvements			4,271.47	5.94	
12. Utilities & Heating Fuel			3,178.28	4.42	
13. Custom Work & Machine Rental			240.59	0.33	
14. Association Dues, Prof'l Fees, Promotion and Travel			2,294.56	3.19	
15. Small Tools, Supplies & Miscellaneous Expenses			4,705.68	6.55	
16. Operating Interest			452.19	0.63	
17. Paid Labour & Benefits	2,521.53	hours	43,871.16	61.04	
18. Unpaid Labour	808.14	hours	15,720.70	21.87	
VARIABLE COSTS			123739.51	172.14	0.90
(C)					
1. Land Rent / Lease, Bldg. Rent & Forage Access			1,684.44	2.34	
2. Taxes, Licences & General Insurance			7,600.42	10.57	
3. Equipment & Building			43,374.70	60.34	
		a) Depreciation			
		b) Lease Payments	0.00	0.00	
4. Paid Capital Interest			1,638.22	2.28	
TOTAL CAPITAL COSTS			54,297.78	75.53	0.40
(D) CASH COSTS	(B+C-B18-C3a)		118,941.89	165.48	0.87
(E) TOTAL PRODUCTION COSTS	(B+C)		178,037.29	247.69	1.30
(F) GROSS MARGIN	(A-D)		91,683	128	0.67
RETURN TO UNPAID LABOUR	(A-E+B18)		48,308	67	0.35
RETURN TO INVESTMENT	(A-E+C4)	5.9%	34,226	48	0.25
RETURN TO EQUITY	(A-E)		32,588	45	0.24
MANAGEMENT					
	Number of Hives			719	
	Average Yield per Hive (lb.)			191.02	
	Honey Produced (lb.)			137,304.03	

Investment Costs:

Investment costs were divided into four categories, namely land, buildings, bee equipment (including machinery), and vehicles. The study participants were asked to provide market value of land, buildings, bee equipment, machinery and vehicles to estimate total investment and depreciation for an average beekeeping operation. Actual interest paid on capital was used to arrive at total capital cost which also included depreciation for buildings, bee equipment, and vehicles. Details on land, buildings, and bee equipment and machinery investment are presented in Table 6.

For the study sample, land associated with the beekeeping operation averaged 11.45 acres, and this was valued at \$36,798 (\$3,214 per acre) or \$51 per hive. Building investment per study participant was estimated at \$208,454 or \$290 per hive. Bee equipment investment was \$245,510 per average operation or \$342 per hive. Machinery (automotive) investment was based on the percentage use of vehicles for the honey operation. This investment was estimated at \$93,043 or \$129 per hive in 2016. When all of the investment items were added together, total investment amounted to \$583,806 per average beekeeping operation or \$812 per hive.

Table 6: Honey Production Enterprise Investment, Alberta, 2016

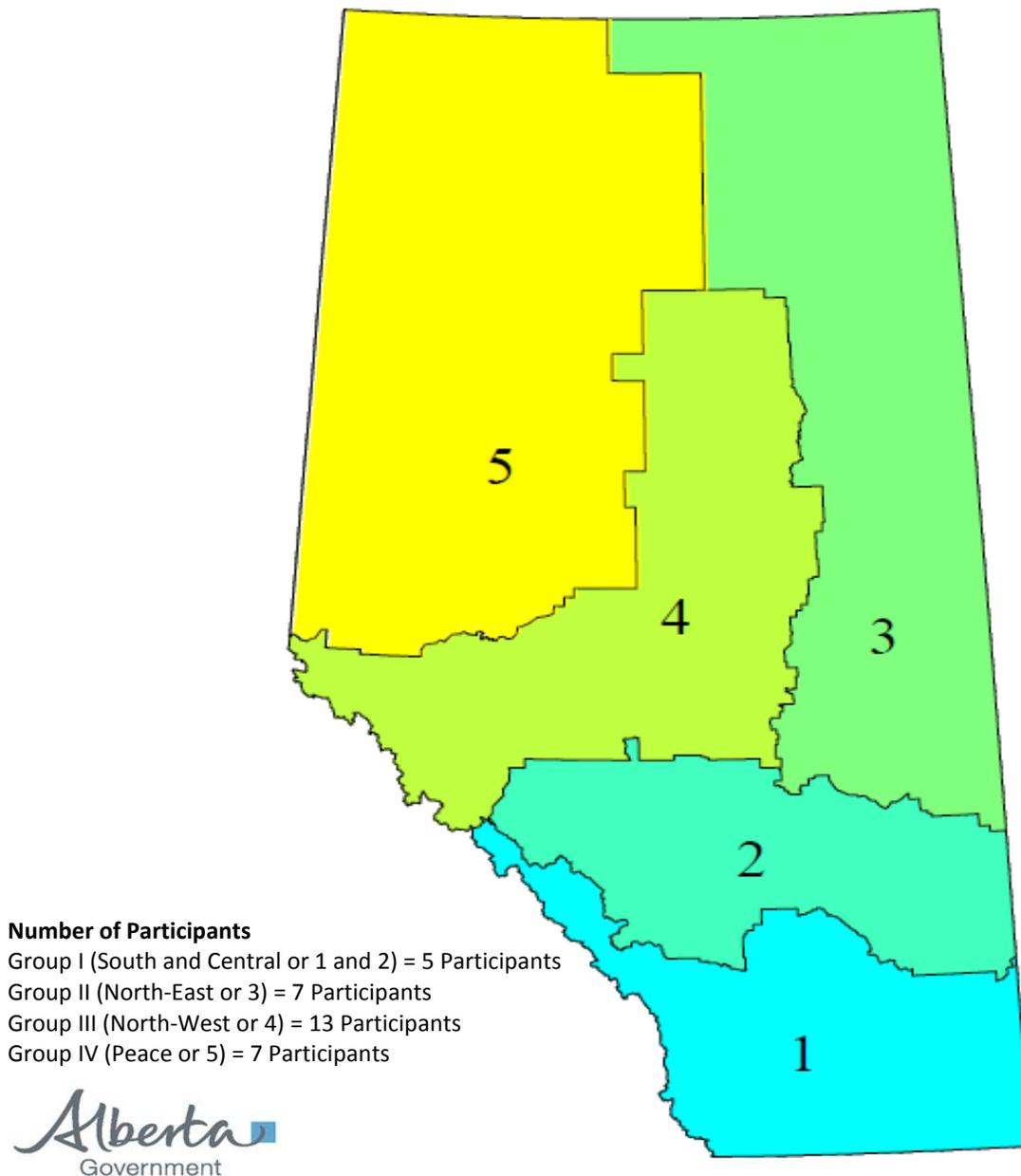
INVESTMENT SUMMARY:		Total \$	\$/Hive	
Land	11.45 acres	36,798	51	
Buildings		208,454	290	
Bee Equipment		245,510	342	
Machinery		93,043	129	
TOTAL INVESTMENT		583,806	812.22	
INVESTMENT DETAIL:		Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land		36,798.44		
Honey House		71,250.00	13.09	3,562.50
Wintering Shed		0.00	0.00	0.00
Houses (25%)		47,207.03	27.94	2,360.35
Other Bldgs		89,996.88	18.97	4,499.84
Buildings Sub-Total		208,453.91		10,422.69
Hives		113,163.47	10.13	13,013.80
Pallets		6,252.09	8.61	718.99
Fork Lift		36,814.00	9.56	2,945.12
Hive Feeders		8,642.97	7.41	993.94
Super Elevator		0.00	0.00	0.00
Uncapping Machines		5,756.88	10.53	460.55
Honey Extractor		20,822.13	16.44	1,665.77
Dryer/Heat Exchanger		2,287.50	4.09	183.00
Wax Spinner/Separator		7,124.59	6.84	569.97
Honey Tank & Pipe		6,439.25	13.78	740.51
Feed Tank		4,556.25	9.59	523.97
Storage Vessel		0.00	0.00	0.00
Boiler Furnace		2,508.59	5.13	200.69
Water System		0.00	0.00	0.00
Compressor		845.31	7.05	67.63
Pressure Washer		3,510.01	5.27	280.80
Fuel Tank		0.00	0.00	0.00
Scales		1,151.24	7.34	132.39
Barrels		3,298.92	2.88	379.38
Barrel Loader		0.00	0.00	0.00
Carts		852.36	7.19	98.02
Fencers / Shockers		526.56	0.89	60.55
Shop Tools		5,296.59	10.30	609.11
Staplers		607.78	8.75	69.89
Office Equipment		0.00	0.00	0.00
Lawn Mower		3,928.88	5.75	314.31
Over-Wintering Insulation		8,461.31	6.23	973.05
Miscellaneous Equipment		2,663.76	2.16	301.85
Equipment Sub - Total		245,510.44		25,303.29
Trucks		81,547.22	13.38	6,523.78
Tractors		0.00	0.00	0.00
Other Machinery		11,496.16	6.07	450.58
Power Equipment Sub - Total		93,043.38		6,974.36
TOTAL INVESTMENT		583,806.17		42,700.34

SECTION IV

HONEY PRODUCTION COSTS AND RETURNS BY REGIONS, 2016

The study sample of 32 honey producers was divided by regions into four groups. Five beekeepers were in Group I which comprise of South and Central regions. Groups II (North-East) had seven beekeepers, Group III (North-West) had 13 beekeepers and Group IV (Peace) had seven beekeepers. Figure 8 shows the distribution of the of 32 honey producers by region.

Figure 8: Distribution of Honey Study Participants by Region



Group I (South and Central Region):

The results for Group I are presented in Tables 7 and 8 and the information is based on the average of five (5) study participants. As shown in Table 7, study participants in this group operated on average 227 hives. Yield per hive for this group was estimated at 173 pounds, about 48 pounds higher than the provincial average. Average honey production for this group was 39,290 pounds. Total value of production including wax/pollen and miscellaneous receipts for this group amounted to \$73,035 per average beekeeper or \$321 per hive (\$1.86 per pound).

Average variable costs per study participant in Group I was estimated at \$38,134 or \$168 per hive or \$0.97 per pound of honey produced. Average capital costs for Group I participants amounted to \$16,702 per operation, or \$74 per hive (\$0.43 per pound of honey produced). Average total production cost for study participants was estimated at \$54,836 per beekeeping operation and \$241 per hive or \$1.40 per pound of honey produced in 2016. Details on total value of production, variable costs, capital costs, cash costs and total production cost for Group I participants are given in Table 7.

Gross margin for study participants in Group I was estimated at \$38,583 per beekeeping operation with 227 hives or \$170 per hive or \$0.98 per pound of honey produced. Average return to unpaid labour was positive at \$25,070 per operation and \$110 per hive (\$0.64 per pound of honey produced). Return to investment for this group was positive at \$19,400 or \$85 per hive. Average return to equity was also positive at \$18,200 per beekeeping operation. In terms of return to equity per hive and per pound of honey produced, it amounted to \$80 and \$0.46 respectively. Details on gross margin, returns to unpaid labour, investment and equity are presented in Table 7, Section F.

Average total investment for land, buildings, bee equipment, and machinery for this group of honey producers is presented in Table 8. Average total investment for honey producers in this group amounted to \$194,535 per operation or \$855 per hive for the 2016 honey production year.

Table 7: Honey Production Costs and Returns, South and Central Region, 2016

(A)			Total \$	\$/Hive	\$/lb
1. Bulk Honey Sales	13,894.00	lbs	19,113.72	84.05	1.38
2. Bulk Honey Inventory	11,000.00	lbs	15,232.50	66.99	
3. Consumer Pack Sales	6,300.00	lbs	23,590.00	103.74	
4. Consumer Pack Inventory	7,996.00	lbs	11,952.88	52.56	
5. Other Honey Sales	100.00	lbs	138.00	0.61	
6. Wax/Pollen/Other Sales	184.00	lbs	1,968.00	8.65	
7. Bee Sales			1,040.00	4.57	
8. Bee/Honey Insurance Receipts			0.00	0.00	
9. Miscellaneous Receipts			0.00	0.00	
10. Less: Honey Purchase for Resale			0.00	0.00	
VALUE OF PRODUCTION			73,035.10	321.17	1.86
(B)					
1. Bee Purchases - Package Bees			1,200.00	5.28	
2. Bee Purchases - Queens			3,312.00	14.56	
3. Bee Purchases - Nucs			49.00	0.22	
4. Freight & Trucking			530.00	2.33	
5. Sugar for Feeding			3,731.60	16.41	
6. Pollen Supplement Feeding			260.00	1.14	
7. Medicinal Sugar/Bee Repellent			1,744.00	7.67	
8. Bee/Honey Insurance			794.60	3.49	
9. Fuel			1,399.60	6.15	
10. Repairs - Machine			609.60	2.68	
11. Repairs - Buildings & Improvements			308.00	1.35	
12. Utilities & Heating Fuel			1,093.80	4.81	
13. Custom Work & Machine Rental			0.00	0.00	
14. Association Dues, Prof'l Fees, Promotion and Travel			1,092.80	4.81	
15. Small Tools, Supplies & Miscellaneous Expenses			1,883.00	8.28	
16. Operating Interest			650.00	2.86	
17. Paid Labour & Benefits	818.8	hours	12,605.60	55.43	
18. Unpaid Labour	362	hours	6,870.00	30.21	
VARIABLE COSTS			38,133.60	167.68	0.97
(C)					
1. Land Rent / Lease, Bldg. Rent & Forage Access			315.80	1.39	
2. Taxes, Licences & General Insurance			1,672.80	7.36	
3. Equipment & Building a) Depreciation			13,513.33	59.43	
b) Lease Payments			0.00	0.00	
4. Paid Capital Interest			1,200.00	5.28	
TOTAL CAPITAL COSTS			16,701.93	73.46	0.43
(D) CASH COSTS	(B+C-B18-C3a)		34,452.20	151.50	0.88
(E) TOTAL PRODUCTION COSTS	(B+C)		54,835.53	241.14	1.40
(F) GROSS MARGIN	(A-D)		38,582.90	169.67	0.98
RETURN TO UNPAID LABOUR	(A-E+B18)		25,069.57	110.24	0.64
RETURN TO INVESTMENT	(A-E+C4)	10.0 %	19,399.57	85.31	0.49
RETURN TO EQUITY	(A-E)		18,199.57	80.03	0.46
MANAGEMENT					
Number of Hives				227	
Average Yield per Hive (lb.)				172.78	
Honey Produced (lb.)				39,290.00	

Table 8: Honey Production Enterprise Investment, South and Central Region, 2016

INVESTMENT SUMMARY:		Total \$	\$/Hive	
Land	9 acres	16,800.00	73.88	
Buildings		89,495.00	393.56	
Bee Equipment		72,094.00	317.04	
Machinery		16,146.20	71.00	
TOTAL INVESTMENT		194,535.20	855.48	
INVESTMENT DETAIL:		Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land		16,800.00		
Honey House		22,000.00	8.80	1,100.00
Wintering Shed		0.00	0.00	0.00
Houses (25%)		28,375.00	22.20	1,418.75
Other Bldgs		39,120.00	15.36	1,956.00
Buildings Sub-Total		89,495.00		4,474.75
Hives		32,400.00	5.60	3,726.00
Pallets		490.00	3.80	56.35
Fork Lift		5,700.00	4.58	456.00
Hive Feeders		2,248.00	3.80	258.52
Super Elevator		0.00	0.00	0.00
Uncapping Machines		1,412.00	8.60	112.96
Honey Extractor		6,500.00	10.20	520.00
Dryer/Heat Exchanger		1,240.00	3.00	99.20
Wax Spinner/Separator		1,000.00	2.40	80.00
Honey Tank & Pipe		3,800.00	8.20	437.00
Feed Tank		740.00	3.00	85.10
Storage Vessel		0.00	0.00	0.00
Boiler Furnace		2,200.00	2.20	176.00
Water System		0.00	0.00	0.00
Compressor		365.00	8.40	29.20
Pressure Washer		1,485.00	2.60	118.80
Fuel Tank		0.00	0.00	0.00
Scales		636.00	3.00	73.14
Barrels		855.00	3.20	98.33
Barrel Loader		0.00	0.00	0.00
Carts		480.00	7.60	55.20
Fencers / Shockers		0.00	0.00	0.00
Shop Tools		3,100.00	8.00	356.50
Staplers		328.00	7.20	37.72
Office Equipment		0.00	0.00	0.00
Lawn Mower		325.00	4.80	26.00
Over-Wintering Insulation		5,530.00	5.80	635.95
Miscellaneous Equipment		1,260.00	5.43	134.40
Equipment Sub - Total		72,094.00		7,572.37
Trucks		10,400.00	9.61	832.00
Tractors		0.00	0.00	0.00
Other Machinery		5,746.20	4.65	60.80
Power Equipment Sub - Total		16,146.20		892.80
TOTAL INVESTMENT		194,535.20		12,939.92

Group II (North-East Region):

Results for this group presented in Tables 9 and 10 are based on the average of seven (7) study participants. Average size of the beekeeping operation for Group II was 1,342 hives. Yield per hive for this group was about 184 pounds, about 59 pounds higher than the provincial average in 2016. Average honey production for this group was 247,336 pounds. Total value of production including wax/pollen and miscellaneous receipts per average beekeeper in this group amounted to \$365,697 or \$272 per hive (\$1.48 per pound of honey produced).

Average variable costs per study participant in Group II was estimated at \$212,948 or \$159 per hive or \$0.86 per pound of honey produced. Average capital costs per study participants in Group II amounted to \$95,248 or \$71 per hive (\$0.39 per pound). Average total production cost for study participants in the North-East Region was estimated at \$308,196 or \$230 per hive or \$1.25 per pound of honey produced. Details on total value of production, variable costs, capital costs, cash costs and total production cost for Group II participants are shown in Table 9.

Gross margin per beekeeping operation in Group II (North-East Region) was estimated at \$135,800 or \$101 per hive or \$0.55 per pound of honey produced. Average return to unpaid labour was positive at \$60,448 per operation or \$45 per hive (\$0.24 per pound). Return to investment for this group was positive at \$62,909 or \$47 per hive. Average return to equity was also positive at \$57,500 per beekeeping operation. In terms of return to equity per hive and per pound of honey produced, it amounted to \$43 and \$0.23 respectively. Details on gross margin, returns to unpaid labour, investment and equity are presented in Table 9, Section F.

Average total investment for land, buildings, bee equipment, and machinery for this group of honey producers is presented in Table 10. Average total investment for honey producers in this group amounted to \$937,682 per operation or \$699 per hive.

Table 9: Honey Production Costs and Returns, North-East Region, 2016

(A)			Total \$	\$/Hive	\$/lb
1. Bulk Honey Sales	243,200.00	lbs	345,132.11	257.10	1.42
2. Bulk Honey Inventory	1,551.00	lbs	2,140.38	1.59	
3. Consumer Pack Sales	1,468.86	lbs	5,595.15	4.17	
4. Consumer Pack Inventory	1,116.57	lbs	2,003.50	1.49	
5. Other Honey Sales	0.00	lbs	0.00	0.00	
6. Wax/Pollen/Other Sales	2,381.00	lbs	10,142.91	7.56	
7. Bee Sales			50.00	0.04	
8. Bee/Honey Insurance Receipts			373.43	0.28	
9. Miscellaneous Receipts			259.05	0.19	
10. Less: Honey Purchase for Resale			0.00	0.00	
VALUE OF PRODUCTION			365,696.53	272.41	1.48
(B)					
1. Bee Purchases - Package Bees			333.57	0.25	
2. Bee Purchases - Queens			12,401.14	9.24	
3. Bee Purchases - Nucs			2,792.86	2.08	
4. Freight & Trucking			6,269.86	4.67	
5. Sugar for Feeding			28,142.14	20.96	
6. Pollen Supplement Feeding			1,642.86	1.22	
7. Medicinal Sugar/Bee Repellent			14,836.00	11.05	
8. Bee/Honey Insurance			4,646.14	3.46	
9. Fuel			7,477.14	5.57	
10. Repairs - Machine			6,061.71	4.52	
11. Repairs - Buildings & Improvements			3,214.29	2.39	
12. Utilities & Heating Fuel			2,930.71	2.18	
13. Custom Work & Machine Rental			660.00	0.49	
14. Association Dues, Prof'l Fees, Promotion and Travel			3,109.11	2.32	
15. Small Tools, Supplies & Miscellaneous Expenses			3,902.26	2.91	
16. Operating Interest			21.43	0.02	
17. Paid Labour & Benefits	864.67	hours	111,559.57	83.10	
18. Unpaid Labour	533.33	hours	2,947.50	2.20	
VARIABLE COSTS			212,948.29	158.63	0.86
(C)					
1. Land Rent / Lease, Bldg. Rent & Forage Access			3,161.57	2.36	
2. Taxes, Licences & General Insurance			11,325.36	8.44	
3. Equipment & Building a) Depreciation			75,352.44	56.13	
b) Lease Payments			0.00	0.00	
4. Paid Capital Interest			5,408.43	4.03	
TOTAL CAPITAL COSTS			95,247.80	70.96	0.39
(D) CASH COSTS	(B+C-B18-C3a)		229,896.15	171.25	0.93
(E) TOTAL PRODUCTION COSTS	(B+C)		308,196.09	229.58	1.25
(F) GROSS MARGIN	(A-D)		135,800.38	101.16	0.55
RETURN TO UNPAID LABOUR	(A-E+B18)		60,447.94	45.03	0.24
RETURN TO INVESTMENT	(A-E+C4)	6.7%	62,908.87	46.86	0.25
RETURN TO EQUITY	(A-E)		57,500.44	42.83	0.23
MANAGEMENT					
Number of Hives				1,342	
Average Yield per Hive (lb.)				184.25	
Honey Produced (lb.)				247,336.43	

Table 10: Honey Production Enterprise Investment, North-East Region, 2016

INVESTMENT SUMMARY:		Total \$	\$/Hive
Land	16.40 acres	28,685.71	21.37
Buildings		299,642.86	223.21
Bee Equipment		438,824.78	326.89
Machinery		170,529.14	127.03
TOTAL INVESTMENT		937,682.49	698.50

INVESTMENT DETAIL:	Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land	28,685.71		
Honey House	104,285.71	16.14	5,214.29
Wintering Shed	0.00	0.00	0.00
Houses (25%)	41,785.71	32.86	2,089.29
Other Bldgs	153,571.43	20.42	7,678.57
Buildings Sub-Total	299,642.85		14,982.15
Hives	264,170.71	10.43	30,379.63
Pallets	11,095.29	12.00	1275.96
Fork Lift	65,649.71	9.59	5,251.98
Hive Feeders	5,623.14	11.00	646.66
Super Elevator	0.00	0.00	0.00
Uncapping Machines	5,380.00	11.29	430.40
Honey Extractor	23,572.57	12.86	1,885.81
Dryer/Heat Exchanger	857.14	3.00	68.57
Wax Spinner/Separator	9,483.86	5.71	758.71
Honey Tank & Pipe	9,608.00	15.71	1104.92
Feed Tank	4,700.00	12.14	540.50
Storage Vessel	0.00	0.00	0.00
Boiler Furnace	7,300.00	8.29	584.00
Water System	0.00	0.00	0.00
Compressor	753.57	4.57	60.29
Pressure Washer	2,242.20	5.57	179.38
Fuel Tank	0.00	0.00	0.00
Scales	415.69	4.14	47.80
Barrels	953.21	5.14	109.62
Barrel Loader	0.00	0.00	0.00
Carts	1485.07	6.71	170.78
Fencers / Shockers	1421.43	1.14	163.46
Shop Tools	4,527.27	11.43	520.64
Staplers	200.00	5.43	23.00
Office Equipment	0.00	0.00	0.00
Lawn Mower	2,959.86	7.71	236.79
Over-Wintering Insulation	12,263.14	9.57	1410.26
Miscellaneous Equipment	4,162.91	3.24	465.75
Equipment Sub - Total	438,824.77		46,314.91
Trucks	145,015.86	10.73	11,601.27
Tractors	0.00	0.00	0.00
Other Machinery	25,513.29	8.09	1096.91
Power Equipment Sub - Total	170,529.15		12,698.18
TOTAL INVESTMENT	937,682.48		73,995.24

Group III (North-West Region):

Results for this group presented in Tables 11 and 12 are based on the average of 13 study participants. On average, beekeepers in this group operated 767 hives and their average yield per hive was 198 pounds. Honey production for Group III study participants was almost 73 pounds per hive higher than the 2016 provincial average of 125 pounds. Average honey production by study participants in Group III was 151,534 pounds. Average total value of production including wax/pollen and miscellaneous receipts for this group was estimated \$232,816 per operation. This translates to \$304 per hive or \$1.54 per pound of honey produced.

Total variable costs per study participants in the North-West Region amounted to \$138,970 or \$181 per hive or \$0.92 per pound of honey produced. When capital costs were added to variable costs, average total production cost per study participants in Group III was estimated at \$200,055 or \$261 per hive or \$1.32 per pound of honey produced.

Gross margin was estimated at \$106,791 per beekeeping operation in Group III. This translates to \$139 per hive or \$0.70 per pound of honey produced. Return to unpaid labour for these study participants was \$58,067 on average or \$76 per hive or \$0.38 per pound of honey produced. Average return to investment was estimated at \$33,253 or approximately \$43 per hive and \$0.22 per pound of honey produced. Average return to equity was estimated at \$33,761 respectively or approximately \$43 per hive and \$0.22 per pound of honey produced.

Details on honey sales (returns), variable and capital costs and management indicators are presented in Table 11.

Average total investment for land, buildings, bee equipment, and machinery (vehicles) for study participants in the North-West Region amounted to \$685,739 per operation or \$894 per hive. Details on investment and investment costs for this group are presented in Table 12.

Table 12: Honey Production Enterprise Investment, North-West Region, 2016

INVESTMENT SUMMARY:		Total \$	\$/Hive	
Land	7.27 acres	55,673.08	72.6	
Buildings		247,888.46	323.26	
Bee Equipment		273,037.77	356.05	
Machinery		109,140.00	142.32	
TOTAL INVESTMENT		685,739.31	894.23	
INVESTMENT DETAIL:		Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land		55,673.08		
Honey House		76,923.08	11.31	3,846.15
Wintering Shed		0.00	0.00	0.00
Houses (25%)		65,480.77	30.15	3,274.04
Other Bldgs		105,484.62	20.17	5,274.23
Buildings Sub-Total		247,888.47		12,394.42
Hives		94,895.08	9.46	10,912.93
Pallets		7,434.62	9.42	854.98
Fork Lift		45,769.23	10.87	3,661.54
Hive Feeders		14,036.38	5.92	1614.18
Super Elevator		0.00	0.00	0.00
Uncapping Machines		9,076.92	11.92	726.15
Honey Extractor		27,061.54	15.31	2,164.92
Dryer/Heat Exchanger		3,692.31	3.85	295.38
Wax Spinner/Separator		10,707.69	8.15	856.62
Honey Tank & Pipe		7,192.31	12.23	827.12
Feed Tank		7,076.92	7.54	813.85
Storage Vessel		0.00	0.00	0.00
Boiler Furnace		721.15	4.31	57.69
Water System		0.00	0.00	0.00
Compressor		1157.69	6.88	92.62
Pressure Washer		5,838.46	6.73	467.08
Fuel Tank		0.00	0.00	0.00
Scales		1,911.54	9.85	219.83
Barrels		7,093.69	1.85	815.77
Barrel Loader		0.00	0.00	0.00
Carts		583.08	6.62	67.05
Fencers / Shockers		146.15	0.96	16.81
Shop Tools		7,792.31	10.73	896.12
Staplers		816.08	12.23	93.85
Office Equipment		0.00	0.00	0.00
Lawn Mower		7,344.62	6.00	587.57
Over-Wintering Insulation		9,628.46	4.50	1107.27
Miscellaneous Equipment		3,061.54	0.70	352.08
Equipment Sub - Total		273,037.77		27,501.41
Trucks		101,423.08	13.56	8,113.85
Tractors		0.00	0.00	0.00
Other Machinery		7,716.92	5.43	396.62
Power Equipment Sub - Total		109,140.00		8,510.47
TOTAL INVESTMENT		685,739.32		48,406.30

Group IV (Peace River Region):

Seven (7) honey producers provided detailed information on their operations from the Peace River Region. On average, study participants in the Peace Region operated 357 hives. Average yield for producers in the Peace Region was 199 pounds per hive, about 74 pounds higher than the provincial average. Average total value of production including wax/pollen and miscellaneous receipts for this group amounted to \$112,619 per beekeeping operation or \$316 per hive (\$1.59 per pound of honey produced).

Average variable costs for the seven honey producers in the Peace Region amounted to \$67,392 per operation and \$189 per hive or \$0.95 per pound of honey produced. Average capital costs amounted to \$27,597 per operation, or \$77 per hive (\$0.39 per pound of honey produced). When capital costs were added to variable costs, average total production cost amounted to \$94,989 per average beekeeper in this group. This translates to \$266 per hive or \$1.34 per pound of honey produced. Details on total value of production, variable costs, capital costs, cash costs and total production cost for the six honey producers in the Peace Region are presented in Table 13.

Average gross margin for the beekeepers in the Peace River Region was positive at \$57,437 per beekeeper. Gross margin per hive was \$161 or \$0.81 per pound of honey produced. Return to unpaid labour was positive at \$34,644 per average beekeeping operation or \$97 per hive or \$0.49 per pound of honey produced. Average return to investment for this group of honey producers was estimated at \$17,939 per beekeeping operation or \$50 per hive or \$0.25 per pound of honey produced. Return to equity in the Peace Region was estimated at \$17,630 per average beekeeping operation. This translate to \$49 per hive or \$0.25 per pound of honey produced. Details on gross margin and returns to unpaid labour, investment and equity are presented in Table 13.

Investment for land, buildings, bee equipment, machinery and vehicles for the seven study participants in the Peace River Region amounted to \$318,676 per beekeeping operation or \$893 per hive. Details on land, buildings, and bee equipment and machinery investments for the beekeepers in the Peace River Region are presented in Table 14.

Table 13: Honey Production Costs and Returns, Peace River Region, 2016

(A)			Total \$	\$/Hive	\$/lb
1. Bulk Honey Sales	51,723.57	lbs	74,332.23	208.30	1.44
2. Bulk Honey Inventory	16,288.57	lbs	20,785.71	58.25	
3. Consumer Pack Sales	2,385.71	lbs	7,950.00	22.28	
4. Consumer Pack Inventory	457.14	lbs	2,285.71	6.41	
5. Other Honey Sales	0.00	lbs	0.00	0.00	
6. Wax/Pollen/Other Sales	455.71	lbs	1,921.43	5.38	
7. Bee Sales			171.43	0.48	
8. Bee/Honey Insurance Receipts			5,172.86	14.50	
9. Miscellaneous Receipts			0.00	0.00	
10. Less: Honey Purchase for Resale			0.00	0.00	
VALUE OF PRODUCTION			112,619.37	315.58	1.59
(B)					
1. Bee Purchases - Package Bees			-	-	
2. Bee Purchases - Queens			2,110.29	5.91	
3. Bee Purchases - Nucs			-	-	
4. Freight & Trucking			1,642.86	4.60	
5. Sugar for Feeding			6,385.71	17.89	
6. Pollen Supplement Feeding			207.14	0.58	
7. Medicinal Sugar/Bee Repellent			3,577.71	10.03	
8. Bee/Honey Insurance			3,635.71	10.19	
9. Fuel			3,031.29	8.49	
10. Repairs - Machine			3,013.71	8.45	
11. Repairs - Buildings & Improvements			2,485.71	6.97	
12. Utilities & Heating Fuel			2,461.86	6.90	
13. Custom Work & Machine Rental			439.86	1.23	
14. Association Dues, Prof'l Fees, Promotion and Travel			1,417.86	3.97	
15. Small Tools, Supplies & Miscellaneous Expenses			2,944.14	8.25	
16. Operating Interest			695.71	1.95	
17. Paid Labour & Benefits	945.86	hours	16,328.57	45.76	
18. Unpaid Labour	891.43	hours	17,014.29	47.68	
VARIABLE COSTS			67,392.42	188.85	0.95
(C)					
1. Land Rent / Lease, Bldg. Rent & Forage Access			1,401.43	3.93	
2. Taxes, Licences & General Insurance			3,093.43	8.67	
3. Equipment & Building a) Depreciation			22,792.83	63.87	
b) Lease Payments			0.00	0.00	
4. Paid Capital Interest			309.14	0.87	
TOTAL CAPITAL COSTS			27,596.83	77.34	0.39
(D) CASH COSTS (B+C-B18-C3a)			55,182.13	154.63	0.78
(E) TOTAL PRODUCTION COSTS (B+C)			94,989.25	266.18	1.34
(F) GROSS MARGIN (A-D)			57,437.24	160.95	0.81
RETURN TO UNPAID LABOUR (A-E+B18)			34,644.41	97.08	0.49
RETURN TO INVESTMENT (A-E+C4)			17,939.26	50.27	0.25
RETURN TO EQUITY (A-E)			17,630.12	49.40	0.25
MANAGEMENT					
Number of Hives				357	
Average Yield per Hive (lb.)				199	
Honey Produced (lb.)				70,855.00	

Table 14: Honey Production Enterprise Investment, Peace River Region, 2016

INVESTMENT SUMMARY:		Total \$	\$/Hive
Land	16.00 acres	24,142.86	67.65
Buildings		129,000.00	361.49
Bee Equipment		124,942.86	350.12
Machinery		40,590.43	113.74
TOTAL INVESTMENT		318,676.15	893.00

INVESTMENT DETAIL:	Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land	24,142.86		
Honey House	62,857.14	16.43	3,142.86
Wintering Shed	0.00	0.00	0.00
Houses (25%)	32,142.86	23.00	1,607.14
Other Bldgs	34,000.00	17.86	1,700.00
Buildings Sub-Total	129,000.00		6,450.00
Hives	53,771.43	14.29	6,183.71
Pallets	3,328.57	7.14	382.79
Fork Lift	13,571.43	10.63	1,085.71
Hive Feeders	6,214.29	9.14	714.64
Super Elevator	0.00	0.00	0.00
Uncapping Machines	3,071.43	8.57	245.71
Honey Extractor	16,714.29	26.57	1,337.14
Dryer/Heat Exchanger	1,857.14	6.43	148.57
Wax Spinner/Separator	2,485.71	8.71	198.86
Honey Tank & Pipe	3,757.14	18.71	432.07
Feed Tank	2,457.14	15.57	282.57
Storage Vessel	0.00	0.00	0.00
Boiler Furnace	1,257.14	5.57	100.57
Water System	0.00	0.00	0.00
Compressor	700.00	8.86	56.00
Pressure Washer	1,900.00	4.14	152.00
Fuel Tank	0.00	0.00	0.00
Scales	842.86	9.00	96.93
Barrels	342.86	2.29	39.43
Barrel Loader	0.00	0.00	0.00
Carts	985.71	8.43	113.36
Fencers / Shockers	714.29	1.14	82.14
Shop Tools	3,000.00	10.00	345.00
Staplers	828.57	6.71	95.29
Office Equipment	0.00	0.00	0.00
Lawn Mower	1,128.57	4.00	90.29
Over-Wintering Insulation	4,585.71	6.43	527.36
Miscellaneous Equipment	1,428.57	1.43	164.29
Equipment Sub - Total	124,942.85		12,874.43
Trucks	31,985.71	18.38	2,558.86
Tractors	0.00	0.00	0.00
Other Machinery	8,604.71	6.25	182.86
Power Equipment Sub - Total	40,590.42		2,741.72
TOTAL INVESTMENT		318,676.13	22,066.15

SECTION V

HONEY PRODUCTION COSTS AND RETURNS BY SIZE OF OPERATION, 2016

The study sample of 32 beekeepers who produced primarily honey was further divided into five groups by size of operation. The main objective of analyzing the data by size of operation was to study economies of scale, i.e., whether size of operation had any effect on overall production costs and net returns. Following are the five groups by size of operation.

GROUP	SIZE OF OPERATION	NUMBER OF PARTICIPANTS	AVERAGE NUMBER OF HIVES PER BEEKEEPER
V	5 to 1,000 hives	26	286
VI	400 to 1,000 hives	7	584
VII	100 to 399 hives	10	296
VIII	Less than 100 hives	9	44
IX	Over 1,000 hives	6	2,594
TOTAL		32	719

Group V (5 to 1,000 Hives):

Table 15 presents the results for 26 study participants who fall within this group. The number of hives owned by this group of participants ranged from five to 800 hives. The number of hives per average study participant for this group was 286. In 2016, average honey production per hive for this group was 189 pounds, about 63 pounds per hive higher than the provincial honey yield in 2016. The total value of production (bulk honey sales, bulk honey inventory, consumer pack sales, consumer pack inventory, wax/pollen sales and other honey sales) amounted to \$93,094 per operation (\$325 per hive) or \$1.73 per pound of honey produced.

Variable Costs:

Average variable costs per operation for this group of honey producers (5 to 1,000 hives) amounted to \$53,474 or \$187 per hive or \$1.00 per pound of honey produced. The most significant costs for this group of beekeepers were paid labour and benefits at \$48 per hive or \$0.26 per pound of honey produced followed by unpaid labour, sugar for feeding, bee purchases, small tools, supplies and miscellaneous expenses, repairs, medicinal sugar/bee repellent, fuel, utilities and heating fuel.

Capital Costs:

Average land rent/lease, depreciation for buildings, bee equipment and vehicles, and capital interest paid by the 26 study participants in Group V amounted to \$24,504 or \$86 per hive or \$0.46 per pound of honey produced. Breakdown of capital costs is also shown in Table 15.

Total Production Costs:

Average total production cost per study participant was estimated at \$77,978 for honey operation with 286 hives. Average total production costs was estimated at \$273 per hive or \$1.45 per pound of honey produced.

Management Indicators:

Average gross margin for Group V (5 to 1,000 hives) was estimated at \$47,639 per beekeeping operation. It was \$167 per hive or \$0.89 per pound of honey produced. Average return to unpaid labour was positive at \$97 per hive or \$0.52 per pound of honey produced. Return to investment and equity were positive at \$55 and \$53 per hive, respectively. Average return to investment was estimated at 5.4 percent for honey producers with 5 to 1,000 hives in 2016. Details on cash, operator and family labour, capital costs, and management indicators are given in Table 15.

Investment Costs:

Average total investment for honey producers in the 5 to 1,000 hives group was \$291,685 per operation or \$1,020 per hive. Land area associated with the honey operation for this group was about nine acres, valued at \$31,333 or \$3,160 per acre (\$110 per hive). Investments per hive in buildings, bee equipment and machinery were estimated at \$399, \$387 and \$124 respectively. Table 16 presents details on land, buildings, bee equipment, machinery and vehicles investment for the 26 study participants with 5 to 1,000 hives.

Table 15: Honey Production Costs and Returns, by Size (5 to 1,000 hives), 2016

(A)			Total \$	\$/Hive	\$/lb
1. Bulk Honey Sales	34,422.58	lbs	48,185.36	168.46	1.40
2. Bulk Honey Inventory	11,502.96	lbs	15,913.47	55.63	
3. Consumer Pack Sales	6,104.77	lbs	21,839.69	76.35	
4. Consumer Pack Inventory	1,691.08	lbs	2,981.52	10.42	
5. Other Honey Sales	19.23	lbs	26.54	0.09	
6. Wax/Pollen/Other Sales	498.58	lbs	2,265.38	7.92	
7. Bee Sales			246.15	0.86	
8. Bee/Honey Insurance Receipts			1,566.31	5.48	
9. Miscellaneous Receipts			69.74	0.24	
10. Less: Honey Purchase for Resale			0.00	0.00	
VALUE OF PRODUCTION			93,094.16	325.46	1.73
(B)					
1. Bee Purchases - Package Bees			956.73	3.34	
2. Bee Purchases - Queens			2,816.27	9.85	
3. Bee Purchases - Nucs			761.35	2.66	
4. Freight & Trucking			895.46	3.13	
5. Sugar for Feeding			5,262.54	18.40	
6. Pollen Supplement Feeding			326.62	1.14	
7. Medicinal Sugar/Bee Repellent			2,395.04	8.37	
8. Bee/Honey Insurance			1,401.42	4.90	
9. Fuel			2,338.35	8.17	
10. Repairs - Machine			1,698.27	5.94	
11. Repairs - Buildings & Improvements			1,098.65	3.84	
12. Utilities & Heating Fuel			2,038.65	7.13	
13. Custom Work & Machine Rental			129.23	0.45	
14. Association Dues, Prof'l Fees, Promotion and Travel			986.45	3.45	
15. Small Tools, Supplies & Miscellaneous Expenses			3,446.34	12.05	
16. Operating Interest			550.77	1.93	
17. Paid Labour & Benefits	784.08	hours	13,775.35	48.16	
18. Unpaid Labour	673.10	hours	12,596.25	44.04	
VARIABLE COSTS			53,473.74	186.95	1.00
(C)					
1. Land Rent / Lease, Bldg. Rent & Forage Access			876.58	3.06	
2. Taxes, Licences & General Insurance			3,140.94	10.98	
3. Equipment & Building a) Depreciation			19,926.63	69.66	
b) Lease Payments			0.00	0.00	
4. Paid Capital Interest			560.15	1.96	
TOTAL CAPITAL COSTS			24,504.30	85.66	0.46
(D) CASH COSTS	(B+C-B18-C3a)		45,455.16	158.91	0.85
(E) TOTAL PRODUCTION COSTS	(B+C)		77,978.04	272.61	1.45
(F) GROSS MARGIN	(A-D)		47,639.00	166.55	0.89
RETURN TO UNPAID LABOUR	(A-E+B18)		27,712.37	96.88	0.52
RETURN TO INVESTMENT	(A-E+C4)		15,676.27	54.80	0.29
RETURN TO EQUITY	(A-E)		15,116.12	52.85	0.28
MANAGEMENT					
Number of Hives				286	
Average Yield per Hive (lb.)				187.88	
Honey Produced (lb.)				53,740.62	

Table 16: Honey Production Enterprise Investment, by Size (5 to 1,000 hives), 2016

INVESTMENT SUMMARY:		Total \$	\$/Hive	
Land	9.42 acres	31,332.69	109.54	
Buildings		114,130.35	399.00	
Bee Equipment		110,642.44	386.81	
Machinery		35,579.19	124.39	
TOTAL INVESTMENT		291,684.67	1,019.74	
INVESTMENT DETAIL:		Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land		31,332.69		
Honey House		32,615.38	10.04	1,630.77
Wintering Shed		0.00	0.00	0.00
Houses (25%)		35,908.65	26.54	1,795.43
Other Bldgs		45,606.31	19.43	2,280.32
Buildings Sub-Total		114,130.34		5,706.52
Hives		46,268.12	9.19	5,320.83
Pallets		2,415.85	6.44	277.82
Fork Lift		15,096.38	8.38	1,207.71
Hive Feeders		3,110.38	6.62	357.69
Super Elevator		0.00	0.00	0.00
Uncapping Machines		3,446.92	10.35	275.75
Honey Extractor		14,804.15	16.85	1,184.33
Dryer/Heat Exchanger		1,084.62	2.92	86.77
Wax Spinner/Separator		2,421.77	6.23	193.74
Honey Tank & Pipe		3,265.50	13.73	375.53
Feed Tank		1,403.85	9.35	161.44
Storage Vessel		0.00	0.00	0.00
Boiler Furnace		1,318.27	4.27	105.46
Water System		0.00	0.00	0.00
Compressor		528.31	6.98	42.26
Pressure Washer		1,614.78	4.52	129.18
Fuel Tank		0.00	0.00	0.00
Scales		809.88	6.65	93.14
Barrels		686.71	2.85	78.97
Barrel Loader		0.00	0.00	0.00
Carts		655.06	6.50	75.33
Fencers / Shockers		301.92	0.90	34.72
Shop Tools		2,813.65	9.52	323.57
Staplers		491.27	8.38	56.50
Office Equipment		0.00	0.00	0.00
Lawn Mower		1,880.81	5.62	150.46
Over-Wintering Insulation		4,747.42	5.48	545.95
Miscellaneous Equipment		1,476.82	1.98	164.32
Equipment Sub - Total		110,642.44		11,241.47
Trucks		28,888.81	13.89	2,311.10
Tractors		0.00	0.00	0.00
Other Machinery		6,690.38	5.94	232.89
Power Equipment Sub - Total		35,579.19		2,543.99
TOTAL INVESTMENT		291,684.66		19,491.98

Group VI (400 to 1,000 Hives):

Results for this group presented in Tables 17 and 18 are based on the average of seven (7) study participants. The average number of hives for this group of seven (7) beekeepers was 584 hives and their average yield was 196 pounds per hive. Total value of production for this group was estimated at \$195,838 per beekeeping operation or \$335 per hive (\$1.71 per pound).

Variable Costs:

Average variable costs for beekeepers in Group VI (400 to 1,000 hives) was estimated at \$116,695 per beekeeping operation or \$200 per hive (\$1.02 per pound). Average paid labour and benefits was \$49 per hive, the largest expense item in variable costs. Expenses associated with unpaid labour, sugar for feeding, fuel, small tools, supplies and miscellaneous and bee purchases were the next four largest expense items.

Capital Costs:

Average land rent/lease, depreciation for buildings, bee equipment and vehicles, and capital interest paid by the seven study participants who operated 400 to 1,000 hives amounted to \$47,127 or \$81 per hive or \$0.41 per pound of honey produced. The breakdown of capital costs are shown in Table 17.

Total Production Costs:

Average total production costs for honey producers in this size group, was estimated at \$163,822 per average beekeeping operation. In terms of per hive or per pound of honey produced, average production cost for this group was \$281 or \$1.43 respectively.

Management Indicators:

Gross margin for Group VI participants (400 to 1,000 hives) was estimated at \$94,807 per average beekeeping operation. It was \$162 per hive or \$0.83 per pound of honey produced. Average return to unpaid labour was positive at \$98 per hive or \$0.50 per pound of honey produced. Return to investment and equity were positive at \$56 and \$55 per hive, respectively. Details on management indicators are presented in Table 17.

Investment Costs:

Average total investment per operation for study participants in Group VI was \$514,845 or \$882 per hive. Details on land, buildings, bee equipment and machinery are presented in Table 18.

Table 17: Honey Production Costs and Returns, by Size (400 to 1,000 Hives), 2016

(A)			Total \$	\$/Hive	\$/lb
1. Bulk Honey Sales	77,612.43	lbs	106,316.20	182.09	1.37
2. Bulk Honey Inventory	24,451.00	lbs	31,513.81	53.98	
3. Consumer Pack Sales	12,574.14	lbs	47,316.15	81.04	
4. Consumer Pack Inventory	48.29	lbs	122.16	0.21	
5. Other Honey Sales	0.00	lbs	0.00	0.00	
6. Wax/Pollen/Other Sales	1,225.43	lbs	5,979.98	10.24	
7. Bee Sales			0.00	0.00	
8. Bee/Honey Insurance Receipts			4,330.57	7.42	
9. Miscellaneous Receipts			259.05	0.44	
10. Less: Honey Purchase for Resale			0.00	0.00	
VALUE OF PRODUCTION			195,837.92	335.42	1.71
(B)					
1. Bee Purchases - Package Bees			571.43	0.98	
2. Bee Purchases - Queens			5,977.43	10.24	
3. Bee Purchases - Nucs			2,685.71	4.60	
4. Freight & Trucking			2,409.29	4.13	
5. Sugar for Feeding			10,721.57	18.36	
6. Pollen Supplement Feeding			381.00	0.65	
7. Medicinal Sugar/Bee Repellent			5,116.29	8.76	
8. Bee/Honey Insurance			4,456.86	7.63	
9. Fuel			5,958.14	10.20	
10. Repairs - Machine			4,551.00	7.79	
11. Repairs - Buildings & Improvements			2,714.29	4.65	
12. Utilities & Heating Fuel			4,091.43	7.01	
13. Custom Work & Machine Rental			40.14	0.07	
14. Association Dues, Prof'l Fees, Promotion and Travel			2,357.14	4.04	
15. Small Tools, Supplies & Miscellaneous Expenses			9,494.57	16.26	
16. Operating Interest			1,142.86	1.96	
17. Paid Labour & Benefits	1,567.14	hours	28,839.00	49.39	
18. Unpaid Labour	1,392.86	hours	25,187.14	43.14	
VARIABLE COSTS			116,695.29	199.86	1.02
(C)					
1. Land Rent / Lease, Bldg. Rent & Forage Access			2,102.14	3.60	
2. Taxes, Licences & General Insurance			6,540.29	11.20	
3. Equipment & Building a) Depreciation			37,603.53	64.41	
b) Lease Payments			0.00	0.00	
4. Paid Capital Interest			880.57	1.51	
TOTAL CAPITAL COSTS			47,126.53	80.72	0.41
(D) CASH COSTS	(B+C-B18-C3a)		101,031.15	173.04	0.88
(E) TOTAL PRODUCTION COSTS	(B+C)		163,821.82	280.58	1.43
(F) GROSS MARGIN	(A-D)		94,806.77	162.38	0.83
RETURN TO UNPAID LABOUR	(A-E+B18)		57,203.24	97.97	0.50
RETURN TO INVESTMENT	(A-E+C4)		32,896.67	56.34	0.29
RETURN TO EQUITY	(A-E)		32,016.10	54.84	0.28
MANAGEMENT					
Number of Hives				584	
Average Yield per Hive (lb.)				196.43	
Honey Produced (lb.)				114,685.86	

Table 18: Honey Production Enterprise Investment, by Size (400 to 1,000 Hives), 2016

INVESTMENT SUMMARY:		Total \$	\$/Hive	
Land	15.34 acres	42,557.14	72.89	
Buildings		172,130.57	294.82	
Bee Equipment		216,269.35	370.41	
Machinery		83,887.86	143.68	
TOTAL INVESTMENT		514,844.92	881.80	
INVESTMENT DETAIL:		Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land		42,557.14		
Honey House		29,714.29	21.86	1,485.71
Wintering Shed		0.00	0.00	0.00
Houses (25%)		57,750.00	20.00	2,887.50
Other Bldgs		84,666.29	25.30	4,233.31
Buildings Sub-Total		172,130.58		8,606.52
Hives		99,290.71	11.00	11,418.43
Pallets		3,444.57	7.21	396.13
Fork Lift		30,715.14	11.64	2,457.21
Hive Feeders		5,193.86	9.29	597.29
Super Elevator		0.00	0.00	0.00
Uncapping Machines		5,985.71	9.14	478.86
Honey Extractor		26,586.86	14.00	2,126.95
Dryer/Heat Exchanger		314.29	0.86	25.14
Wax Spinner/Separator		4,109.43	5.71	328.75
Honey Tank & Pipe		3,957.57	12.29	455.12
Feed Tank		3,592.86	13.57	413.18
Storage Vessel		0.00	0.00	0.00
Boiler Furnace		2,514.29	8.29	201.14
Water System		0.00	0.00	0.00
Compressor		980.14	11.64	78.41
Pressure Washer		3,751.34	7.21	300.11
Fuel Tank		0.00	0.00	0.00
Scales		1,515.26	13.29	174.25
Barrels		1,475.63	7.71	169.70
Barrel Loader		0.00	0.00	0.00
Carts		1293.07	6.86	148.70
Fencers / Shockers		792.86	2.64	91.18
Shop Tools		3,993.56	12.21	459.26
Staplers		1446.29	9.43	166.32
Office Equipment		0.00	0.00	0.00
Lawn Mower		4,453.00	5.14	356.24
Over-Wintering Insulation		9,420.43	10.21	1083.35
Miscellaneous Equipment		1,442.49	2.05	152.90
Equipment Sub - Total		216,269.36		22,078.62
Trucks		70,072.71	12.23	5,605.82
Tractors		0.00	0.00	0.00
Other Machinery		13,815.14	7.33	631.29
Power Equipment Sub - Total		83,887.85		6,237.11
TOTAL INVESTMENT		514,844.93		36,922.25

Group VII (100 to 399 Hives):

Results for Group VII (100 to 399 hives) presented in Tables 19 and 20 are based on the average of 10 honey producers. The average number of hives for this group of 10 beekeepers was 296 hives and their average yield was 179 pounds per hive. Total value of production for this group was estimated at \$87,717 per beekeeping operation or \$297 per hive or \$1.66 per pound.

Variable Costs:

Average variable costs for beekeepers in Group VII was estimated at \$48,175 per beekeeping operation or \$163 per hive (\$0.91 per pound). Average paid labour and benefits estimated at \$53 per hive was the largest expense item in variable costs. Expenses associated with unpaid labour, sugar for feeding, bee purchases and medicinal sugar/bee repellent were the next four largest expense items.

Capital Costs:

Average land rent/lease, depreciation for buildings, bee equipment and vehicles, and capital interest paid by the 10 study participants who operated 100 to 399 hives amounted to \$25,481 or \$86 per hive (\$0.48 per pound of honey produced). The breakdown of capital costs are shown in Table 19.

Total Production Costs:

Average total production costs for honey producers in this size group, was \$73,656 per average beekeeping operation. In terms of per hive and per pound of honey produced, average production cost for this group was \$249 and \$1.40 respectively.

Management Indicators:

Gross margin for Group VII participants (100 to 399 hives) was estimated at \$47,652 per average beekeeping operation. It was \$161 per hive or \$0.90 per pound of honey produced. Average return to unpaid labour was positive at \$88 per hive or \$0.49 per pound of honey produced. Return to investment and equity were positive at \$50 and \$48 per hive respectively. Details on management indicators are presented in Table 19.

Investment Costs:

Average total investment per operation for study participants in Group VII was \$340,073 or \$1,150 per hive. Details on land, buildings, etc. are presented in Table 20.

Table 19: Honey Production Costs and Returns, by Size (100 to 399 Hives), 2016

(A)			Total \$	\$/Hive	\$/lb
1. Bulk Honey Sales	33,747.00	lbs	47,858.86	161.90	1.42
2. Bulk Honey Inventory	11,842.00	lbs	17,105.35	57.87	
3. Consumer Pack Sales	3,880.00	lbs	14,404.00	48.73	
4. Consumer Pack Inventory	3,308.00	lbs	5,723.44	19.36	
5. Other Honey Sales	0.00	lbs	0.00	0.00	
6. Wax/Pollen/Other Sales	393.50	lbs	1,464.00	4.95	
7. Bee Sales			120.00	0.41	
8. Bee/Honey Insurance Receipts			1,041.00	3.52	
9. Miscellaneous Receipts			0.00	0.00	
10. Less: Honey Purchase for Resale			0.00	0.00	
VALUE OF PRODUCTION			87,716.65	296.74	1.66
(B)					
1. Bee Purchases - Package Bees			416.00	1.41	
2. Bee Purchases - Queens			2,686.00	9.09	
3. Bee Purchases - Nucs			-	-	
4. Freight & Trucking			296.70	1.00	
5. Sugar for Feeding			5,601.50	18.95	
6. Pollen Supplement Feeding			375.00	1.27	
7. Medicinal Sugar/Bee Repellent			2,316.50	7.84	
8. Bee/Honey Insurance			385.60	1.30	
9. Fuel			1,489.00	5.04	
10. Repairs - Machine			1,064.80	3.60	
11. Repairs - Buildings & Improvements			692.50	2.34	
12. Utilities & Heating Fuel			1,906.10	6.45	
13. Custom Work & Machine Rental			307.90	1.04	
14. Association Dues, Prof'l Fees, Promotion and Travel			691.60	2.34	
15. Small Tools, Supplies & Miscellaneous Expenses			1,843.00	6.23	
16. Operating Interest			557.00	1.88	
17. Paid Labour & Benefits	933.60	hours	15,524.60	52.52	
18. Unpaid Labour	591.00	hours	12,021.00	40.67	
VARIABLE COSTS			48,174.80	162.97	0.91
(C)					
1. Land Rent / Lease, Bldg. Rent & Forage Access			688.20	2.33	
2. Taxes, Licences & General Insurance			2,552.60	8.64	
3. Equipment & Building a) Depreciation			21,570.36	72.97	
b) Lease Payments			0.00	0.00	
4. Paid Capital Interest			670.00	2.27	
TOTAL CAPITAL COSTS			25,481.16	86.21	0.48
(D) CASH COSTS	(B+C-B18-C3a)		40,064.60	135.54	0.76
(E) TOTAL PRODUCTION COSTS	(B+C)		73,655.96	249.17	1.40
(F) GROSS MARGIN	(A-D)		47,652.05	161.20	0.90
RETURN TO UNPAID LABOUR	(A-E+B18)		26,081.69	88.23	0.49
RETURN TO INVESTMENT	(A-E+C4) 4.3%		14,730.69	49.83	0.28
RETURN TO EQUITY	(A-E)		14,060.69	47.57	0.27
MANAGEMENT					
Number of Hives				296	
Average Yield per Hive (lb.)				178.54	
Honey Produced (lb.)				52,777.00	

Table 20: Honey Production Enterprise Investment, by Size (100 to 399 Hives), 2016

INVESTMENT SUMMARY:		Total \$	\$/Hive
Land	11.30 acres	48,900.00	165.43
Buildings		144,300.00	488.16
Bee Equipment		120,377.90	407.23
Machinery		26,495.40	89.63
TOTAL INVESTMENT		340,073.30	1,150.45

INVESTMENT DETAIL:	Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land	48,900.00		
Honey House	58,000.00	10.10	2,900.00
Wintering Shed	0.00	0.00	0.00
Houses (25%)	36,750.00	31.50	1,837.50
Other Bldgs	49,550.00	21.80	2,477.50
Buildings Sub-Total	144,300.00		7,215.00
Hives	45,940.00	12.40	5,283.10
Pallets	3,700.00	9.30	425.50
Fork Lift	17,450.00	12.73	1,396.00
Hive Feeders	3,774.00	7.30	434.01
Super Elevator	0.00	0.00	0.00
Uncapping Machines	4,000.00	16.30	320.00
Honey Extractor	17,800.00	24.70	1,424.00
Dryer/Heat Exchanger	2,600.00	7.00	208.00
Wax Spinner/Separator	3,400.00	11.70	272.00
Honey Tank & Pipe	4,600.00	21.80	529.00
Feed Tank	840.00	9.70	96.60
Storage Vessel	0.00	0.00	0.00
Boiler Furnace	1,580.00	3.60	126.40
Water System	0.00	0.00	0.00
Compressor	425.00	6.50	34.00
Pressure Washer	1,190.00	5.30	95.20
Fuel Tank	0.00	0.00	0.00
Scales	870.00	4.50	100.05
Barrels	412.50	1.80	47.44
Barrel Loader	0.00	0.00	0.00
Carts	715.00	10.40	82.22
Fencers / Shockers	230.00	0.50	26.45
Shop Tools	2,730.00	11.00	313.95
Staplers	125.90	11.50	14.48
Office Equipment	0.00	0.00	0.00
Lawn Mower	1,410.50	5.40	112.84
Over-Wintering Insulation	4,385.00	4.20	504.27
Miscellaneous Equipment	2,200.00	1.00	253.00
Equipment Sub - Total	120,377.90		12,098.51
Trucks	20,800.00	18.02	1,664.00
Tractors	0.00	0.00	0.00
Other Machinery	5,695.40	6.75	142.00
Power Equipment Sub - Total	26,495.40		1,806.00
TOTAL INVESTMENT		340,073.30	21,119.51

Group VIII (Less than 100 Hives):

About nine (9) beekeepers who managed from 5 to 99 hives were surveyed in this group. On average each beekeeper operated 44 hives and their average yield was 169 pounds per hive. As shown in Table 21, the total value of production for this group was estimated at \$19,157 per beekeeping operation or \$438 per hive or \$2.59 per pound of honey produced.

Variable Costs:

Average variable costs for beekeepers with less than 100 hives was estimated at \$10,189 or \$233 per hive (\$1.38 per pound of honey produced). Average unpaid labour estimated at \$79 per hive was the largest expense item in variable costs followed by bee purchases and expenses associated with sugar for feeding.

Capital Costs:

Average land rent/lease, depreciation for buildings, bee equipment and vehicles, and capital interest paid by the nine (9) study participants who operated less than 100 hives amounted to \$5,824 or \$133 per hive (\$0.79 per pound of honey produced). The breakdown of capital costs are shown in Table 21.

Total Production Costs:

Average total production costs for honey producers in this size group, was \$16,013 per average beekeeping operation. In terms of per hive and per pound of honey produced, average production cost for this group was \$366 and \$2.16 respectively.

Management Indicators:

Gross margin for Group VIII participants (Less than 100 hives) was estimated at \$10,938 per average beekeeping operation. It was \$250 per hive or \$1.48 per pound of honey produced. Average return to unpaid labour was positive at \$150 per hive or \$0.89 per pound of honey produced. Return to investment and equity were positive at \$76 and \$72 per hive, respectively. Average return to investment for honey producers with less than 100 was estimated at approximately 5.2 percent. Details on management indicators are presented in Table 21.

Investment Costs:

Average total investment per operation for study participants in Group VIII was \$64,350 or \$1,470 per hive. Details on land, buildings, etc. are presented in Table 22.

Table 21: Honey Production Costs and Returns, by Size (Less than 100 Hives), 2016

(A)			Total \$	\$/Hive	\$/lb
1. Bulk Honey Sales	1,581.11	lbs	3,335.28	76.19	2.11
2. Bulk Honey Inventory	1,055.56	lbs	2,455.56	56.09	
3. Consumer Pack Sales	3,545.00	lbs	10,286.53	234.97	
4. Consumer Pack Inventory	1,172.22	lbs	2,158.89	49.31	
5. Other Honey Sales	55.56	lbs	76.67	1.75	
6. Wax/Pollen/Other Sales	50.00	lbs	266.67	6.09	
7. Bee Sales			577.78	13.20	
8. Bee/Honey Insurance Receipts			0.00	0.00	
9. Miscellaneous Receipts			0.00	0.00	
10. Less: Honey Purchase for Resale			0.00	0.00	
VALUE OF PRODUCTION			19,157.38	437.58	2.59
(B)					
1. Bee Purchases - Package Bees			1,857.22	42.42	
2. Bee Purchases - Queens			502.33	11.47	
3. Bee Purchases - Nucs			110.56	2.53	
4. Freight & Trucking			383.33	8.76	
5. Sugar for Feeding			640.00	14.62	
6. Pollen Supplement Feeding			230.56	5.27	
7. Medicinal Sugar/Bee Repellent			365.78	8.36	
8. Bee/Honey Insurance			153.67	3.51	
9. Fuel			466.67	10.66	
10. Repairs - Machine			183.33	4.19	
11. Repairs - Buildings & Improvements			293.33	6.70	
12. Utilities & Heating Fuel			589.33	13.46	
13. Custom Work & Machine Rental			0.00	0.00	
14. Association Dues, Prof'l Fees, Promotion and Travel			247.98	5.66	
15. Small Tools, Supplies & Miscellaneous Expenses			523.64	11.96	
16. Operating Interest			83.33	1.90	
17. Paid Labour & Benefits	8.89	hours	115.56	2.64	
18. Unpaid Labour	204.50	hours	3,442.50	78.64	
VARIABLE COSTS			10,189.12	232.75	1.38
(C)					
1. Land Rent / Lease, Bldg. Rent & Forage Access			132.67	3.03	
2. Taxes, Licences & General Insurance			1,150.72	26.29	
3. Equipment & Building a) Depreciation			4,351.57	99.40	
b) Lease Payments			0.00	0.00	
4. Paid Capital Interest			188.89	4.31	
TOTAL CAPITAL COSTS			5,823.85	133.03	0.79
(D) CASH COSTS	(B+C-B18-C3a)		8,218.90	187.73	1.11
(E) TOTAL PRODUCTION COSTS	(B+C)		16,012.97	365.76	2.16
(F) GROSS MARGIN	(A-D)		10,938.48	249.85	1.48
RETURN TO UNPAID LABOUR	(A-E+B18)		6,586.91	150.45	0.89
RETURN TO INVESTMENT		5.2 %	3,333.30	76.14	0.45
RETURN TO EQUITY	(A-E)		3,144.41	71.82	0.42
MANAGEMENT					
Number of Hives				44	
Average Yield per Hive (lb.)				169.25	
Honey Produced (lb.)				7,409.44	

Table 22: Honey Production Enterprise Investment, by Size (Less than 100 Hives), 2016

INVESTMENT SUMMARY:		Total \$	\$/Hive	
Land	2.72 acres	3,083.33	70.43	
Buildings		35,497.22	810.85	
Bee Equipment		17,671.00	403.65	
Machinery		8,098.89	185.00	
TOTAL INVESTMENT		64,350.44	1,469.93	
INVESTMENT DETAIL:		Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land		3,083.33		
Honey House		6,666.67	0.78	333.33
Wintering Shed		0.00	0.00	0.00
Houses (25%)		17,986.11	26.11	899.31
Other Bldgs		10,844.44	12.23	542.22
Buildings Sub-Total		35,497.22		1,774.86
Hives		5,392.89	4.22	620.18
Pallets		188.89	2.67	21.72
Fork Lift		333.33	1.00	26.67
Hive Feeders		752.56	3.78	86.54
Super Elevator		0.00	0.00	0.00
Uncapping Machines		857.78	4.67	68.62
Honey Extractor		2,311.11	10.33	184.89
Dryer/Heat Exchanger		0.00	0.00	0.00
Wax Spinner/Separator		22.22	0.56	1.78
Honey Tank & Pipe		1,244.44	5.89	143.11
Feed Tank		327.78	5.67	37.69
Storage Vessel		0.00	0.00	0.00
Boiler Furnace		97.22	1.89	7.78
Water System		0.00	0.00	0.00
Compressor		291.67	3.89	23.33
Pressure Washer		425.00	1.56	34.00
Fuel Tank		0.00	0.00	0.00
Scales		194.44	3.89	22.36
Barrels		377.78	0.22	43.44
Barrel Loader		0.00	0.00	0.00
Carts		92.22	1.89	10.61
Fencers / Shockers		0.00	0.00	0.00
Shop Tools		1,988.89	5.78	228.72
Staplers		154.44	4.11	17.76
Office Equipment		0.00	0.00	0.00
Lawn Mower		402.78	6.22	32.22
Over-Wintering Insulation		1,515.56	3.22	174.29
Miscellaneous Equipment		700.00	3.02	74.67
Equipment Sub - Total		17,671.00		1,860.38
Trucks		5,844.44	10.59	467.56
Tractors		0.00	0.00	0.00
Other Machinery		2,254.44	3.96	24.00
Power Equipment Sub - Total		8,098.88		491.56
TOTAL INVESTMENT		64,350.43		4,126.80

Group IX (Over 1,000 Hives):

The average number of hives for this group of six (6) beekeepers was 2,594 hives. The number of hives they managed ranged from 1,690 hives to 3,200 hives and on average, their average production was estimated at 193 pounds per hive. Section A in Table 23 presents total value of production (bulk honey sales, consumer pack sales, and honey held in inventory, wax/pollen sales and miscellaneous receipts, and other honey sales). It was estimated at \$719,925 per beekeeping operation or \$278 per hive (\$1.44 per pound).

Variable Costs:

Average variable costs for Group IX (Over 1,000 hives) was estimated at \$428,225 per beekeeping operation or \$165 per hive or \$0.86 per pound of honey produced. Average paid labour and benefits estimated at \$67 per hive was largest expense item in variable costs. Expenses associated with sugar for feeding, machine and building repairs, medicinal sugar/bee repellent and bee purchases were the next four largest expense items.

Capital Costs:

Average land rent/lease, depreciation for buildings, bee equipment and vehicles, and capital interest paid by the six (6) study participants in Group IX amounted to \$183,403 or \$71 per hive (\$0.37 per pound of honey produced). Breakdown of capital costs are shown in Table 23.

Total Production Costs:

Average total production costs for honey producers in this size group, was estimated at \$611,627 per average beekeeping operation. This translates to \$236 per hive or \$1.22 per pound of honey produced.

Management Indicators:

Gross margin for Group IX participants (Over 1,000 hives) was estimated at \$282,541 per average beekeeping operation. It was \$109 per hive or \$0.57 per pound of honey produced. Average return to unpaid labour was positive at \$53 per hive or \$0.28 per pound of honey produced. Return to investment and equity were positive at \$44 and \$42 per hive, respectively. Average return to investment was estimated at approximately 6.2 percent for honey producers with over 1,000 hives in 2016. Details on management indicators are presented in Table 23.

Table 23: Honey Production Costs and Returns, by Size (Over 1,000 Hives), 2016

(A)			Total \$	\$/Hive	\$/lb
1. Bulk Honey Sales	490,564.50	lbs	673,313.09	259.57	1.37
2. Bulk Honey Inventory	0.00	lbs	0.00	0.00	
3. Consumer Pack Sales	1,301.33	lbs	4,772.37	1.84	
4. Consumer Pack Inventory	7,546.33	lbs	10,888.89	4.20	
5. Other Honey Sales	0.00	lbs	0.00	0.00	
6. Wax/Pollen/Other Sales	6,531.83	lbs	27,301.36	10.52	
7. Bee Sales			58.33	0.02	
8. Bee/Honey Insurance Receipts			1,437.50	0.55	
9. Miscellaneous Receipts			2,153.50	0.83	
10. Less: Honey Purchase for Resale			0.00	0.00	
VALUE OF PRODUCTION			719,925.04	277.53	1.44
(B)					
1. Bee Purchases - Package Bees			0.00	0.00	
2. Bee Purchases - Queens			30,160.50	11.63	
3. Bee Purchases - Nucs			0.00	0.00	
4. Freight & Trucking			11,125.83	4.29	
5. Sugar for Feeding			57,872.67	22.31	
6. Pollen Supplement Feeding			2,917.67	1.12	
7. Medicinal Sugar/Bee Repellent			30,798.50	11.87	
8. Bee/Honey Insurance			14,559.17	5.61	
9. Fuel			15,422.67	5.95	
10. Repairs - Machine			16,810.17	6.48	
11. Repairs - Buildings & Improvements			18,020.33	6.95	
12. Utilities & Heating Fuel			8,116.67	3.13	
13. Custom Work & Machine Rental			723.17	0.28	
14. Association Dues, Prof'l Fees, Promotion and Travel			7,963.00	3.07	
15. Small Tools, Supplies & Miscellaneous Expenses			10,162.83	3.92	
16. Operating Interest			25.00	0.01	
17. Paid Labour & Benefits	10,050.50	hours	174,286.33	67.19	
18. Unpaid Labour	1,393.33	hours	29,260.00	11.28	
VARIABLE COSTS			428,224.51	165.09	0.86
(C)					
1. Land Rent / Lease, Bldg. Rent & Forage Access			5,185.17	2.00	
2. Taxes, Licences & General Insurance			26,924.83	10.38	
3. Equipment & Building a) Depreciation			144,982.98	55.89	
b) Lease Payments			0.00	0.00	
4. Paid Capital Interest			6,309.83	2.43	
TOTAL CAPITAL COSTS			183,402.81	70.70	0.37
(D) CASH COSTS (B+C-B18-C3a)			437,384.34	168.61	0.88
(E) TOTAL PRODUCTION COSTS (B+C)			611,627.32	235.79	1.22
(F) GROSS MARGIN (A-D)			282,540.70	108.92	0.57
RETURN TO UNPAID LABOUR (A-E+B18)			137,557.72	53.03	0.28
RETURN TO INVESTMENT (A-E+C4)			114,607.55	44.18	0.23
RETURN TO EQUITY (A-E)			108,297.72	41.75	0.22
MANAGEMENT					
Number of Hives				2,594	
Average Yield per Hive (lb.)				192.53	
Honey Produced (lb.)				499,412.17	

Investment Costs:

Average total investment for the study participants in Group IX (Over 1,000 hives) was estimated at \$1,849,666 per operation or \$713 per hive. Land area associated with the honey operation for this group was about 20 acres, valued at \$60,483 or \$2,990 per acre or \$23 per hive. Bee equipment investment was estimated at \$320 per hive, followed by buildings at \$234, and machinery including vehicles, at \$132 per hive. Details on land, buildings, bee equipment, machinery and vehicles investment are presented in Table 24.

Table 24: Honey Production Enterprise Investment, by Size (over 1,000 Hives), 2016

INVESTMENT SUMMARY:		Total \$	\$/Hive	
Land	20.23 acres	60,483.33	23.32	
Buildings		617,189.33	237.93	
Bee Equipment		829,938.50	319.95	
Machinery		342,054.83	131.86	
TOTAL INVESTMENT		1,849,665.99	713.06	
INVESTMENT DETAIL:		Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land		60,483.33		
Honey House		238,666.67	26.33	11,933.33
Wintering Shed		0.00	0.00	0.00
Houses (25%)		96,166.67	34.00	4,808.33
Other Bldgs		282,356.00	16.98	14,117.80
Buildings Sub-Total		617,189.34		30,859.46
Hives		403,043.33	14.17	46,349.98
Pallets		22,875.83	18.00	2630.72
Fork Lift		130,923.67	14.67	10,473.89
Hive Feeders		32,617.50	10.83	3751.01
Super Elevator		0.00	0.00	0.00
Uncapping Machines		15,766.67	11.33	1261.33
Honey Extractor		46,900.00	14.67	3,752.00
Dryer/Heat Exchanger		7,500.00	9.17	600.00
Wax Spinner/Separator		27,503.50	9.50	2200.28
Honey Tank & Pipe		20,192.17	14.00	2322.10
Feed Tank		18,216.67	10.67	2094.92
Storage Vessel		0.00	0.00	0.00
Boiler Furnace		7,666.67	8.83	613.33
Water System		0.00	0.00	0.00
Compressor		2219.00	7.33	177.52
Pressure Washer		11,722.67	8.50	937.81
Fuel Tank		0.00	0.00	0.00
Scales		2,630.50	10.33	302.51
Barrels		14,618.50	3.00	1681.13
Barrel Loader		0.00	0.00	0.00
Carts		1707.33	10.17	196.34
Fencers / Shockers		1500.00	0.83	172.50
Shop Tools		16,056.00	13.67	1,846.44
Staplers		1112.67	10.33	127.96
Office Equipment		0.00	0.00	0.00
Lawn Mower		12,803.83	6.33	1024.31
Over-Wintering Insulation		24,554.83	9.50	2823.81
Miscellaneous Equipment		7,807.17	2.91	897.82
Equipment Sub - Total		829,938.51		86,237.71
Trucks		309,733.67	11.18	24,778.69
Tractors		0.00	0.00	0.00
Other Machinery		32,321.17	6.61	1393.89
Power Equipment Sub - Total		342,054.84		26,172.58
TOTAL INVESTMENT		1,849,666.02		143,269.75

SECTION VI

SUMMARY OF HONEY COSTS AND RETURNS BY REGION AND SIZE

This section provides a summary of the costs and returns for the various groups by region and by size of operation. Specifically, it presents details on total value of production (bulk honey sales, other honey sales and inventory and miscellaneous income). It also provides estimates of cash costs, operator and family labour, capital costs and management indicators. Details on the honey cost and returns for the various groups by region and by size of operation are presented in Tables 25 and 26 respectively. Comparison of these costs and returns are also presented in Figure 9.

Yield per Hive:

Average yield per hive for the 32 honey producers was estimated at 191 pounds during the 2016 production year. This was significantly higher than the provincial average of 125 pounds per hive.

By region as shown in Table 25, Group IV (Peace River) had the highest yield of approximately 199 pounds per hive. Next was Group III (North-West) with a somewhat comparable average yield of approximately 198 pounds per hive. Honey producers in Group II (North-East) had an average of 184 pounds per hive. Honey producers in Group I (South and Central) had the lowest yield of 173 pounds per hive among the regions.

With regards to size (Table 26), the estimated honey yield for beekeepers with 5 to 1,000 hives was 188 pounds compared to the 193 pounds for those with over 1,000 hives. Within the category of beekeepers with 5 to 1,000 hives, larger operations reported higher average yields compared with operations that managed smaller number of hives.

Value of Production:

Average total value of production for the 32 honey producers (bulk honey sales and inventory, consumer pack sales and inventory, and any other honey sales, receipts from wax/pollen, bee sales, bee/honey insurance receipts and other miscellaneous income) was estimated at \$293 per hive.

By region, average total value of production ranged from \$272 per hive in the North-East Region (Group II) to \$321 per hive in the South and Central Region (Group I). Consumer pack sales, value

of honey inventory and other honey sales which typically command higher prices account for about 70 percent of the total value of production for study participants in Group I (South and Central Region). The study participants in Group IV (Peace River) had the highest price of \$1.44 per pound for their bulk honey sales compared to the other regions. On average, study participants in Group IV sold their bulk honey for about six cents per pound higher compared to the provincial average of \$1.38 per pound. This increase in honey prices for Group IV beekeepers is most likely due to light colour produced honey.

By size of operation, Group VIII (study participants with less than 100 hives) had the highest total value of production. This is because of two main reasons; first, about 78 percent of the total value of production was from consumer pack sales, value of honey inventory and other honey sales which typically command higher prices and second they had the highest price of \$2.11 per pound for their bulk honey sales compared to the other size groups. Total value of production per hive was estimated at \$325 for beekeepers with 5 to 1,000 hives (Group V) and \$278 for those with more than 1,000 hives (Group IX). Within the category of beekeepers with 5 to 1,000 hives (Group V), smaller operations reported higher prices for their bulk honey sales compared with those that managed larger number of hives.

Caution is needed when comparing the total value of production by region and size of operation because with the exception of study participants in Group III (North-West), a small amount of bee sales is included in all the miscellaneous incomes.

Total Variable Costs:

Average variable costs for the study sample of 32 honey producers was estimated at \$172 per hive or \$0.91 per pound of honey produced. The most significant variable costs include labour and expenses associated with sugar for feeding. In total, costs associated with hired labour and sugar for the study sample of 32 honey producers was estimated at \$82 per hive or \$0.43 cents per pound of honey produced. This translates to about 48 percent of Total Variable Cost, 50 percent of Total Cash Costs or 33 percent of Total Production Costs.

By region, total variable costs on average ranged from \$159 per hive in the North-East Regions to \$189 per hive in the Peace Region. Hired labour and sugar for feeding costs ranged from \$64 per

hive (34 percent of Total Variable Costs or 24 percent of Total Production Costs) in the Peace Region to \$104 per hive in the North-East Region (66 percent of Total Variable Costs or 45 percent of Total Production Costs).

By size of operation, sugar for feeding and hired labour costs were \$67 per hive for Group V (5 to 1,000 hives) and \$90 per hive for Group IX (over 1,000 hives).

Total Production Costs:

Average total production cost was estimated at \$248 per hive for the study sample of 32 honey producers (\$1.30 per pound of honey produced). These costs ranged from \$230 per hive in the North-East Region to \$266 per hive in the Peace River Region.

By size of operation, total production cost was \$270 per hive (\$1.48 per pound) for honey producers with 5 to 1,000 hives and \$236 per hive (\$1.22 per pound) for those with over 1,000 hives.

Management Indicators:

The net returns were positive for the study sample of 32 honey producers and all groups (by region and by size of operation). Caution is needed when comparing the net returns by region and size of operation because with the exception of study participants in Group III (North-West), a small amount of bee sales is included in all the miscellaneous incomes. It is also worth noting that beekeepers with less than 100 hives, do their bee management by themselves. Details on management indicators for the study sample of 32 honey producers, and all groups (by region and size of operation) are presented in Tables 25 and 26 respectively.

Investment Costs:

As shown in Tables 25 and 26 respectively, the average investment per hive for the study sample of 32 beekeepers was estimated at \$812. By regions, investment per hive ranged from \$699 for producers in Group II (North-East Region) to \$894 in Group III (North-West). By size of operation, average investment per hive was \$1,020 for Group V (5 to 1,000 hives) and \$713 for Group IX (over 1,000 hives). Within the category of beekeepers with 5 to 1,000 hives (Group V), smaller operations had higher investment costs compared with those that managed larger number of hives.

Table 25: Summary of Honey Production Costs and Returns by Region, 2016

	ALBERTA		REGION							
			GROUP I SOUTH AND CENTRAL		GROUP II NORTH-EAST		GROUP III NORTH-WEST		GROUP IV PEACE RIVER	
Number of Participants	32		5		7		13		7	
Average Number of Hives	719		227.4		1,342.4		767		357	
Average Yield Per Hive (lb.)	191.02		172.78		184.25		197.61		198.55	
Honey Produced (lb.)	137,304		39,290		247,336		151,534		70,855	
	\$ Per Hive	\$ Per lb	\$ Per Hive	\$ Per lb	\$ Per Hive	\$ Per lb	\$ Per Hive	\$ Per lb	\$ Per Hive	\$ Per lb
Bulk Honey Sales	230.11	1.38	84.05	1.38	257.10	1.42	226.79	1.33	208.30	1.44
Other Honey Sales/Inventory*	50.16		223.90		7.25		61.58		86.94	
Miscellaneous Income**	12.76		13.22		8.07		15.24		20.36	
TOTAL VALUE OF PRODUCTION	293.03	1.38	321.17	1.86	272.41	1.48	303.60	1.54	315.58	1.59
Feed - Sugar	21.05	0.11	16.41	0.09	20.96	0.11	22.44	0.11	17.89	0.09
Hired Labour	61.04	0.32	55.43	0.32	83.10	0.45	44.70	0.23	45.76	0.23
Operator and Family Labour	21.87	0.11	30.21	0.17	2.20	0.01	33.00	0.17	47.68	0.24
Other Variable Costs	68.18	0.36	65.63	0.38	52.37	0.28	81.08	0.41	77.52	0.39
Total Variable Costs	172.14	0.90	167.68	0.97	158.63	0.86	181.22	0.92	188.85	0.95
Total Capital Costs	75.53	0.40	73.46	0.43	70.96	0.39	79.65	0.40	77.34	0.39
TOTAL CASH COSTS	165.48	0.87	151.50	0.88	171.25	0.93	164.34	0.83	154.63	0.78
TOTAL PRODUCTION COSTS	247.69	1.30	241.14	1.40	229.58	1.25	260.88	1.32	266.18	1.34
MANAGEMENT INDICATORS										
GROSS MARGIN	127.55	0.67	169.67	0.98	101.16	0.55	139.26	0.70	160.95	0.81
RETURN TO UNPAID LABOUR	67.21	0.35	110.24	0.64	45.03	0.24	75.72	0.38	97.08	0.49
RETURN TO INVESTMENT	47.62	0.25	85.31	0.49	46.86	0.25	43.36	0.22	50.27	0.25
RETURN TO EQUITY	45.34	0.24	80.03	0.46	42.83	0.23	42.72	0.22	49.40	0.25
AVERAGE INVESTMENT	812.22	4.25	855.48	4.95	698.50	3.79	894.23	4.53	893.00	4.50
* Includes consumer pack sales, value of honey inventory and other honey sales										
** Includes wax/pollen sales, bee/honey insurance receipts and other miscellaneous receipts										

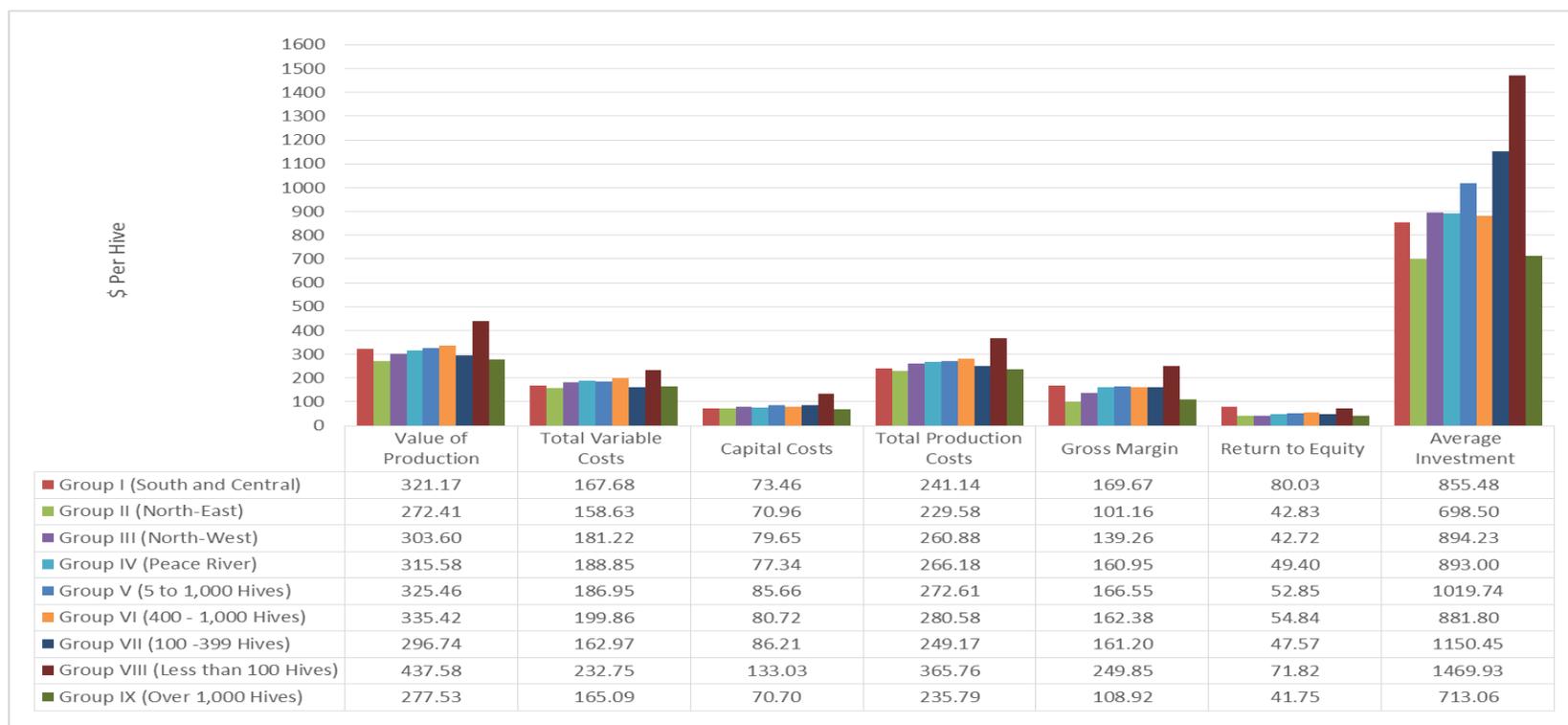
Table 26: Summary of Honey Production Costs and Returns by Size of Operation, 2016

	ALBERTA		SIZE OF OPERATION									
			GROUP V 5 TO 1,000 HIVES		GROUP VI 400 TO 1,000 HIVES		GROUP VII 100 TO 399 HIVES		GROUP VIII LESS THAN 100 HIVES		GROUP IX OVER 1,000 HIVES	
Number of Participants	32		26		7		10		9		6	
Average Number of Hives	719		286		584		296		44		2,594	
Average Yield Per Hive (lb.)	191.02		187.88		196.43		178.54		169.25		192.53	
Honey Produced (lb.)	137,304		53,741		114,686		52,777		7,409		499,412	
	\$ Per Hive	\$ Per lb	\$ Per Hive	\$ Per lb	\$ Per Hive	\$ Per lb	\$ Per Hive	\$ Per lb	\$ Per Hive	\$ Per lb	\$ Per Hive	\$ Per lb
Bulk Honey Sales	230.11	1.38	168.46	1.40	182.09	1.37	161.90	1.42	76.19	2.11	259.57	1.37
Other Honey Sales/Inventory*	50.16		142.49		135.23		125.96		342.12		6.04	
Miscellaneous Income**	12.76		14.50		18.10		8.88		19.29		11.92	
TOTAL VALUE OF PRODUCTION	293.03	1.38	325.46	1.73	335.42	1.71	296.74	1.66	437.58	2.59	277.53	1.44
Feed - Sugar	21.05	0.11	18.40	0.10	18.36	0.09	18.95	0.11	14.62	0.09	22.31	0.12
Hired Labour	61.04	0.32	48.16	0.26	49.39	0.25	52.52	0.29	2.64	0.02	67.19	0.35
Operator and Family Labour	21.87	0.11	44.04	0.23	43.14	0.22	40.67	0.23	78.64	0.46	11.28	0.06
Other Variable Costs	68.18	0.36	76.35	0.41	88.97	0.45	50.83	0.28	136.85	0.81	64.31	0.33
Total Variable Costs	172.14	0.90	186.95	1.00	199.86	1.02	162.97	0.91	232.75	1.38	165.09	0.86
Total Capital Costs	75.53	0.40	85.66	0.46	80.72	0.41	86.21	0.48	133.03	0.79	70.70	0.37
TOTAL CASH COSTS	165.48	0.87	158.91	0.85	173.04	0.88	135.54	0.76	187.73	1.11	168.61	0.88
TOTAL PRODUCTION COSTS	247.69	1.30	272.61	1.45	280.58	1.43	249.17	1.40	365.76	2.16	235.79	1.22
MANAGEMENT INDICATORS												
GROSS MARGIN	127.55	0.67	166.55	0.89	162.38	0.83	161.20	0.90	249.85	1.48	108.92	0.57
RETURN TO UNPAID LABOUR	67.21	0.35	96.88	0.52	97.97	0.50	88.23	0.49	150.45	0.89	53.03	0.28
RETURN TO INVESTMENT	47.62	0.25	54.80	0.29	56.34	0.29	49.83	0.28	76.14	0.45	44.18	0.23
RETURN TO EQUITY	45.34	0.24	52.85	0.28	54.84	0.28	47.57	0.27	71.82	0.42	41.75	0.22
AVERAGE INVESTMENT PER HIVE	812.22	4.25	1,019.74	5.43	881.80	4.49	1,150.45	6.44	1,469.93	8.68	713.06	3.70

* Includes consumer pack sales, value of honey inventory and other honey sales

** Includes wax/pollen sales, bee/honey insurance receipts and other miscellaneous receipts

Figure 9: Honey Production Costs and Returns by Region and Size, 2016 (\$ per Hive)



SUMMARY HIGHLIGHTS:

- 1) By region:
 - a) Group 1 (South and Central) has the highest value of production followed by Group IV (Peace River).
 - b) Total variable cost was the highest in Peace River (Group IV), followed by Group I (South and Central).
 - c) Capital cost did not vary much across regions.
 - d) Gross margin was the highest in Group 1 (South and Central) followed by Group IV (Peace River).
 - e) Return to equity was almost double in Group 1 (South and Central). This is most likely due to reduced production cost and increased value of production.
- 2) By size of operation, beekeepers that kept less than 100 hives achieved the highest return to equity in comparison to other groups. This could be explained by the high value of production due to direct market sales

Efficiency of Resource Use by Honey Producers:

In managing profitability of honey production, the most important areas of concern are the number of hives operated which measures the size of operation, total variable costs and total capital or fixed costs. Since labour costs and sugar feeding costs alone translates to about 48 percent of total variable costs it is important to determine how statistically significant these are.

A multiple regression using Excel was conducted to determine the impact of sugar feeding costs, total labour costs, total variable costs, total capital costs and number of hives operated on the total value of production. The production function approach (Linear and Non-Linear) is used to fit the 2016 cost of production data collected from the 32 beekeepers who produced only honey. The implicit form of the model estimated is expressed as follows:

$$Y = f(X_1, X_2, X_3, X_4, X_5) \dots\dots\dots (1)$$

$$\text{Linear: } Y = \alpha + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \alpha_5 X_5 + u \dots\dots\dots (2)$$

$$\text{Non-Linear (Power function): } Y = \alpha X_1^{\beta_1} X_2^{\beta_2} X_3^{\beta_3} X_4^{\beta_4} X_5^{\beta_5} e^u \dots\dots\dots (3)$$

$$\text{Log } Y = \text{Log} \alpha + \beta_1 \text{Log} X_1 + \beta_2 \text{Log} X_2 + \beta_3 \text{Log} X_3 + \beta_4 \text{Log} X_4 + \varepsilon \dots\dots\dots (4)$$

Where:

Y = Total value of production

X₁ = Sugar feeding costs

X₂ = Total labour costs

X₃ = Total variable costs

X₄ = Total capital costs

X₅ = Number of hives operated

The α 's and β 's are the regression coefficients and u and ε are the error terms for the equations. In equation (4), the coefficients are the elasticities of production in respect to the corresponding input variables. The a-priori expectations for total labour costs, total variable costs, total capital costs and number of hives operated were assumed to be positive, implying that an increase or decrease in any of the variables will lead to a corresponding increase or decrease in the total value of production obtained by these group of beekeepers respectively.

The results of the non-linear model (Equation 4), presented on Table 27 shows that total variable costs and total capital costs are significant at the 1 percent level with an elasticity of 0.71 and 0.35

respectively. This means that a one percent increase in total variable costs and total capital costs will correspondingly increase the total value of production by 0.71 percent and 0.35 percent respectively. This high percentage increase relative to other variables suggests that it is the most important factor of honey production in Alberta *ceteris paribus* (i.e. holding other variables constant). In addition, they conformed to the positive a-priori expectation sign.

Table 27: Results of Regression Coefficients (Non-Linear Model)

Variables	Coefficients	Standard Errors	T- Statistics	P-Value	Elasticities
A	0.0441	0.7770	0.0568	0.9552	0.04
Log Sugar Feeding Costs	-0.0536	0.0738	-0.7265	0.4740	-0.05
Log Total Labour Costs	0.1520	0.1410	1.0781	0.2909	0.15
Log Total Variable Costs	0.7068	0.1337	5.2875***	0.0000	0.71
Log Total Capital Costs	0.3455	0.0763	4.5285***	0.0001	0.35
Log Number of Hives	-0.1512	0.1355	-1.1162	0.2746	-0.15
R Square	0.9900		F-Statistic	516.1888	
Adjusted R Square	0.9981		Significance F	3.853E-25	
Standard Error	0.1642		Observations	32	

*** = Significant at 1%

** = Significant at 5%

* = Significant at 10%

Source: Computed from 2016 Cost of Production Survey Data

Sugar feeding costs, total labour costs and number of hives were insignificant at all levels of significance (1 percent, 5 percent and 10 percent). The number of hives operated and sugar feeding costs both had negative relationship with total value of production. Labour costs on the other hand had a positive relationship with total value of production and conformed to the positive a-priori expectation. The results show that the explanatory variables jointly accounted for about 99 percent of the total variation in value of production of these honey producers. The scale of production, which is obtained through the sum of the elasticities amounted to 1.04 units. This implies that honey production in Alberta exhibits increasing returns to scale (i.e. a unit increase in all inputs leads to an output of 1.04 units).

SECTION VII

COSTS AND RETURNS FOR POLLINATING HIVES IN ALBERTA, 2016

Honeybees have been used for pollinating crops to improve yield and seed production for centuries. In Alberta, commercial use of honeybees to pollinate crops started in 1995 with the introduction of transgenic canola (about twenty two years ago). Other crops for which bees have been used for pollination are borage, alfalfa and clover, etc.

Over the last few years, the number of hives that are supplied for pollination purposes has more than tripled from about 20,000 hives in 1996. The number of pollinating hives continues to increase because the area for transgenic canola and other crops continues to expand. The pedigreed hybrid canola seed production industry continues to grow in Southern Alberta. In 2016, Alberta beekeepers supplied 75,000 colonies for canola pollination.

Eight (8) beekeepers who rented their hives for pollination purposes provided detailed information on their operations for the 2016 production year. These eight beekeepers also extracted honey as well. Before discussing costs and returns data for this group of beekeepers, it is important for readers or users of this report to note that on average about 50 percent of the income for this group was generated from renting beehives for pollination purposes. Balance of the income was received from honey sales, wax and pollen, and miscellaneous receipts. Crops pollinated include canola, blueberry, cranberry, daisies and apples.

On average, each beekeeper in this group managed 3,157 hives. In total, these eight beekeepers operated 25,255 hives. Average yield per hive for this group of beekeepers was estimated at approximately 160 pounds. Average honey production per operation for this group was 504,803 pounds per beekeeping operation.

Value of Production:

Total value of honey produced per study participant (bulk honey sales, inventory, consumer pack sales, consumer pack inventory, and other honey sales) amounted to \$655,291. This translates to an average value per hive of \$208 or \$1.30 per pound of honey produced. Almost 93 percent of the honey produced was sold as bulk honey. Average wax and pollen sales and other miscellaneous income amounted to \$36,113 per operation or approximately \$11 per hive.

As presented in Table 28, hive rental fee for pollinating crops such as canola, blueberries, daisies, etc. on average was estimated at \$150. For canola alone, it was estimated at \$175 per hive and for blueberry it was estimated at \$80 per hive. When average hive rental income from pollination was combined with honey sales and other miscellaneous income, average value of production increased to \$945,281 per operation. This translate to \$299 per hive or \$1.87 per pound of honey produced. Details on value of production (honey and pollination) are presented in Table 28.

Variable Costs:

Average variable costs for the pollination group of beekeepers was estimated at \$548,854 or \$174 per hive or \$1.09 per pound of honey produced. Paid labour and benefits estimated at \$58 per hive was the leading expense item. This was followed by bee purchases and sugar feeding cost.

Capital Costs:

Average capital costs for the eight beekeepers in the pollination group was estimated at \$226,536 per operation or \$72 per hive. The most significant cost item for this group was equipment and building depreciation at \$54 per hive.

Total Production Costs:

Average total production costs for the pollination beekeepers group were calculated at \$775,390 per operation. In terms of total production cost per hive, it was \$246 for an average pollination operation or \$1.54 per pound of honey produced. Total production cost comprised of 71 percent variable costs and about 29 percent capital costs. Details on variable and capital costs are presented in Table 28.

Management Indicators:

Average gross margin for the pollination group of beekeepers was \$380,472 per operation or \$121 per hive. Return to unpaid labour for this group was positive at \$209,966 per operation (\$67 per hive). Average return to investment and equity were also positive at \$60 and \$54 per hive, respectively. Details on gross margin and return to unpaid labour, investment and equity are presented in Table 28.

Investment Costs:

Land associated with this group was over 83 acres, valued at \$196,100 (\$2,359 per acre) or \$62 per hive. Building investment per study participant was estimated at \$809,250 or \$256 per hive. Bee equipment investment was \$929,706 per average operation or \$295 per hive. Machinery investment was based on the percentage use for the business was estimated at \$402,306 or \$127 per hive. When all of the investment costs were added together, total investment for this group of eight (8) beekeepers amounted to \$2,337,362 per operation or approximately \$740 per hive. Details on investment costs are presented in Table 29.

Table 29: Pollination Production Enterprise Investment, Alberta, 2016

INVESTMENT SUMMARY:		Total \$	\$/Hive
Land	83.13 acres	196,100.00	62.12
Buildings		809,250.00	256.35
Bee Equipment		929,706.00	294.50
Machinery		402,305.63	127.44
TOTAL INVESTMENT		2,337,361.63	740.41

INVESTMENT DETAIL:	Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land	196,100.00		
Honey House	287,500.00	4.53	14,375.00
Wintering Shed	0.00	0.00	0.00
Houses (25%)	75,625.00	16.38	3,781.25
Other Buildings	446,125.00	11.63	22,306.25
Buildings Sub-Total	809,250.00		40,462.50
Hives	427,552.00	7.00	49,168.48
Pallets	20,862.50	5.00	2,399.19
Fork Lift	119,000.00	7.30	9,520.00
Hive Feeders	19,828.75	5.00	2,280.31
Super Elevator	0.00	0.00	0.00
Uncapping Machines	22,625.00	10.38	1,810.00
Honey Extractor	73,125.00	8.25	5,850.00
Dryer/Heat Exchanger	5,625.00	4.38	450.00
Wax Spinner/Separator	17,062.50	8.50	1,365.00
Honey Tank & Pipe	18,375.00	7.88	2,113.13
Feed Tank	13,262.50	8.38	1,525.19
Storage Vessel	0.00	0.00	0.00
Boiler Furnace	12,375.00	5.75	990.00
Water System	0.00	0.00	0.00
Compressor	1,906.25	6.63	152.50
Pressure Washer	5,387.50	4.38	431.00
Fuel Tank	0.00	0.00	0.00
Scales	2,714.38	5.00	312.15
Barrels	14,925.88	2.75	1,716.48
Barrel Loader	0.00	0.00	0.00
Carts	1,228.75	6.38	141.31
Fencers / Shockers	150.00	2.13	17.25
Shop Tools	18,750.00	6.25	2,156.25
Staplers	1,937.50	4.38	222.81
Office Equipment	0.00	0.00	0.00
Lawn Mower	4,512.50	4.63	361.00
Over-Wintering Insulation	109,750.00	6.25	12,621.25
Miscellaneous Equipment	18,750.00	0.63	1,500.00
Equipment Sub - Total	929,706.01		97,103.30
Trucks	361,712.50	7.98	28,937.00
Tractors	6,250.00	1.00	500.00
Other Machinery	34,343.13	5.29	1,020.00
Power Equipment Sub - Total	402,305.63		30,457.00
TOTAL INVESTMENT	2,337,361.64		168,022.80

Pollination Production Costs and Returns (South and Central Region):

Results presented in Tables 30 and 31 are based on the average of four beekeepers in the South and Central Regions that rented their hives for pollination and also produced honey. The size of each beekeeping operation in this category was 2,756 hives. Honey production for this group was 175 pounds per hive, about 15 pounds higher than the average of the total sample size for pollination.

Average value of honey sales including wax and miscellaneous receipts for these beekeepers was \$634,161 per beekeeper or 230 per hive (\$1.31 per pound). Approximately 89 percent of the honey produced was sold as bulk honey. When hive rental income was added to the value of honey, wax and other receipts, the total value of production amounted to \$924,531 or \$335 per hive or \$1.92 per pound. Income from hive rental for pollination purposes was about 53 percent of total value of production. Details on value of production (honey and pollination) are presented in Table 29.

Average variable costs for this group of participants was estimated at \$506,834 per beekeeper and \$184 per hive or \$1.05 per pound of honey produced. Average capital costs for this group amounted to \$181,432 per operation, \$66 per hive (\$0.38 per pound). Average total production costs for beekeepers in this group were calculated at \$688,268 per operation and \$250 per hive or \$1.43 per pound of honey produced.

Average gross margin for the four beekeepers in this group was estimated at \$437,071 per operation with 2,756 hives. This translate to \$159 per hive or \$0.91 per pound of honey produced. Average return to unpaid labour was positive at \$280,255 per operation and \$102 per hive (\$0.58 per pound). Returns to investment and equity were also positive. Details on gross margin, returns to unpaid labour, investment and equity are given in Table 30.

Average total investment for land, buildings, bee equipment and machinery for this group was estimated at \$2,173,537 per operation or \$789 per hive. Details on investment are presented in Table 31.

Table 30: Pollination Production Costs and Returns, South and Central, 2016

(A)			Total \$	\$/Hive	\$/lb
1. Bulk Honey Sales	427,242.50	lbs	537,596.50	195.05	1.26
2. Bulk Honey Inventory	46,400.00	lbs	62,640.00	22.73	
3. Consumer Pack Sales	2,380.25	lbs	3,757.35	1.36	
4. Consumer Pack Inventory	5,316.25	lbs	7,247.25	2.63	
5. Other Honey Sales	1,000.00	lbs	1,600.00	0.58	
6. Wax/Pollen/Other Sales	4,500.00		19,875.00	7.21	
7. Bee Sales			1,445.00	0.52	
8. Bee/Honey Insurance Receipts			0.00	0.00	
9. Miscellaneous Receipts			0.00	0.00	
10. Less: Honey Purchase for Resale			0.00	0.00	
11. Hive Rental - Pollination			290,370.00	178.03	
VALUE OF PRODUCTION			924,531.10	335.43	1.92
(B)					
1. Bee Purchases - Package Bees			45,803.50	16.62	0.09
2. Bee Purchases - Queens			24,850.00	9.02	0.05
3. Bee Purchases - Nucs			23,125.00	8.39	0.05
4. Freight & Trucking			16,713.97	6.06	0.03
5. Sugar for Feeding			37,436.50	13.58	0.08
6. Pollen Supplement Feeding			4,804.25	1.74	0.01
7. Medicinal Sugar/Bee Repellent			24,715.75	8.97	0.05
8. Bee/Honey Insurance			9,104.75	3.30	0.02
9. Fuel			30,180.25	10.95	0.06
10. Repairs - Machine			4,526.75	1.64	0.01
11. Repairs - Buildings & Improvements			5,686.25	2.06	0.01
12. Utilities & Heating Fuel			10,348.00	3.75	0.02
13. Custom Work & Machine Rental			8,458.50	3.07	0.02
14. Assoc. Dues, Prof'l Fees, Promotion & Travel			13,226.00	4.80	0.03
15. Small Tools, Supplies & Miscellaneous Expenses			20,879.25	7.58	0.04
16. Operating Interest			3,205.56	1.16	0.01
17. Paid Labour & Benefits	58,090.25	hours	179,779.50	65.23	0.37
18. Unpaid Labour	2,392.00	hours	43,992.00	15.96	0.09
VARIABLE COSTS			506,835.78	183.88	1.05
(C)					
1. Land Rent / Lease, Bldg. Rent & Forage Access			7,000.00	2.54	0.01
2. Taxes, Licences & General Insurance			12,607.25	4.57	0.03
3. Equipment & Building a) Depreciation			156,815.63	56.89	0.33
b) Lease Payments			0.00	0.00	0.00
4. Paid Capital Interest			5,009.35	1.82	0.01
TOTAL CAPITAL COSTS			181,432.23	65.82	0.38
(D) CASH COSTS (B+C-B18-C3a)			487,460.38	176.86	1.01
(E) TOTAL PRODUCTION COSTS (B+C)			688,268.01	249.71	1.43
(F) GROSS MARGIN (A-D)			437,070.72	158.57	0.91
RETURN TO UNPAID LABOUR(A-E+B18)			280,255.09	101.68	0.58
RETURN TO INVESTMENT (A-E+C4)	11.1 %		241,272.44	87.54	0.50
RETURN TO EQUITY (A-E)			236,263.09	85.72	0.49
MANAGEMENT					
Number of Hives				2,756	
Average Yield per Hive (lb.)				175.00	
Honey Produced (lb.)				482,339.00	

Table 31: Pollination Production Enterprise Investment, South and Central, 2016

INVESTMENT SUMMARY:		Total \$	\$/Hive	
Land	101.25 acres	235,500.00	85.44	
Buildings		669,625.00	242.95	
Bee Equipment		876,937.00	318.16	
Machinery		391,475.00	142.03	
TOTAL INVESTMENT		2,173,537.00	788.58	
INVESTMENT DETAIL:		Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land		235,500.00		
Honey House		200,000.00	8.00	10,000.00
Wintering Shed		0.00	0.00	0.00
Houses (25%)		51,250.00	22.25	2,562.50
Other Buildings		418,375.00	14.38	20,918.75
Buildings Sub-Total		669,625.00		33,481.25
Hives		317,004.00	8.25	36,455.46
Pallets		19,125.00	6.00	2,199.38
Fork Lift		113,000.00	10.48	9,040.00
Hive Feeders		29,750.00	7.50	3,421.25
Super Elevator		0.00	0.00	0.00
Uncapping Machines		30,750.00	10.50	2,460.00
Honey Extractor		78,750.00	11.25	6,300.00
Dryer/Heat Exchanger		5,000.00	7.50	400.00
Wax Spinner/Separator		20,000.00	10.00	1,600.00
Honey Tank & Pipe		14,250.00	12.50	1,638.75
Feed Tank		15,750.00	11.75	1,811.25
Storage Vessel		0.00	0.00	0.00
Boiler Furnace		14,000.00	5.25	1,120.00
Water System		0.00	0.00	0.00
Compressor		2,525.00	7.75	202.00
Pressure Washer		3,975.00	6.25	318.00
Fuel Tank		0.00	0.00	0.00
Scales		1,850.00	4.50	212.75
Barrels		9,158.00	4.25	1,053.17
Barrel Loader		0.00	0.00	0.00
Carts		1,125.00	8.00	129.38
Fencers / Shockers		300.00	4.25	34.50
Shop Tools		22,250.00	7.50	2,558.75
Staplers		3,500.00	6.75	402.50
Office Equipment		0.00	0.00	0.00
Lawn Mower		2,125.00	6.50	170.00
Over-Wintering Insulation		172,750.00	8.75	19,866.25
Miscellaneous Equipment		0.00	0.00	0.00
Equipment Sub - Total		876,937.00		91,393.39
Trucks		366,175.00	9.55	29,294.00
Tractors		0.00	0.00	0.00
Other Machinery		25,300.00	5.87	600.00
Power Equipment Sub - Total		391,475.00		29,894.00
TOTAL INVESTMENT		2,173,537.00		154,768.64

Pollination Production Costs and Returns (North-East, North-West and Peace Region):

Results presented in Tables 32 and 33 are based on the average of four (4) beekeepers in the North-East, North-West and Peace River Regions that rented their hives for pollination and also produced honey. Average size of the beekeeping operation was 3,558 hives. Honey production for this group was 148 pounds per hive, 12 pounds lower than the average of the total sample size for pollination.

Average value of honey sales including wax and miscellaneous receipts for these beekeepers was \$738,872 per beekeeper or 208 per hive (\$1.40 per pound). Approximately 97 percent of the honey produced was sold as bulk honey. When hive rental income was added to the value of honey, wax and other receipts, the total value of production amounted to \$966,032 or \$272 per hive or \$1.83 per pound. Income from hive rental for pollination purposes was about 45 percent of total value of production. Details on value of production (honey and pollination) are presented in Table 32.

Average variable costs for this group of participants was estimated at \$590,871 per beekeeper and \$166 per hive or \$1.12 per pound of honey produced. Average capital costs for this group amounted to \$271,640 per operation, \$76 per hive (\$0.52 per pound). Average total production costs for beekeepers in this group were calculated at \$862,511 per operation and \$243 per hive or \$1.64 per pound of honey produced.

Average gross margin for the four (4) beekeepers in this group was estimated at \$323,874 per operation with 3,558 hives. This translates to \$91 per hive or \$0.61 per pound of honey produced. Average return to unpaid labour was positive at \$139,678 per operation and \$39 per hive (\$0.26 per pound). Returns to investment and equity were also positive. Details on gross margin, returns to unpaid labour, investment and equity are given in Table 32.

Average total investment for land, buildings, bee equipment and machinery was estimated at \$2,501,186 per operation or \$703 per hive. Details on investment are presented in Table 33.

Based on the results for Alberta, those who provided pollination services operated more than four times the number of hives, had comparable costs and made slightly more money than those who produced only honey. In addition, pollinators surveyed in the North-East, North-West and Peace River region made more money than those in the South and Central region.

Table 32: Pollination Production Costs and Returns, North-East, North-West and Peace, 2016

(A)			Total \$	\$/Hive	\$/lb
1. Bulk Honey Sales	508,992.50	lbs	668,579.00	187.94	1.31
2. Bulk Honey Inventory	15,750.00	lbs	22,837.50	6.42	
3. Consumer Pack Sales	2,525.00	lbs	6,325.00	1.78	
4. Consumer Pack Inventory	0.00	lbs	0.00	0.00	
5. Other Honey Sales	0.00	lbs	0.00	0.00	
6. Wax/Pollen/Other Sales	8,650.00	lbs	40,275.00	11.32	
7. Bee Sales			855.00	0.24	
8. Bee/Honey Insurance Receipts			0.00	0.00	
9. Miscellaneous Receipts			0.00	0.00	
10. Less: Honey Purchase for Resale			9,775.00	2.75	
11. Hive Rental - Pollination			217,385.00	123.23	
VALUE OF PRODUCTION			966,031.50	271.55	1.83
(B)					
1. Bee Purchases - Package Bees			15,000.00	4.22	
2. Bee Purchases - Queens			50,960.00	14.32	
3. Bee Purchases - Nucs			0.00	0.00	
4. Freight & Trucking			48,480.00	13.63	
5. Sugar for Feeding			90,000.00	25.30	
6. Pollen Supplement Feeding			11,500.00	3.23	
7. Medicinal Sugar/Bee Repellent			40,125.00	11.28	
8. Bee/Honey Insurance			3,320.00	0.93	
9. Fuel			18,855.00	5.30	
10. Repairs - Machine			13,131.25	3.69	
11. Repairs - Buildings & Improvements			4,000.00	1.12	
12. Utilities & Heating Fuel			12,737.50	3.58	
13. Custom Work & Machine Rental			3,075.00	0.86	
14. Assoc. Dues, Prof'l Fees, Promotion & Travel			19,487.50	5.48	
15. Small Tools, Supplies & Miscellaneous Expenses			33,342.50	9.37	
16. Operating Interest			3,000.00	0.84	
17. Paid Labour & Benefits	11,415.25	hours	187,700.00	52.76	
18. Unpaid Labour	1,902.50	hours	36,157.50	10.16	
VARIABLE COSTS			590,871.25	166.07	1.12
(C)					
1. Land Rent / Lease, Bldg. Rent & Forage Access			10,737.50	3.02	
2. Taxes, Licences & General Insurance			39,831.25	11.20	
3. Equipment & Building			184,196.36	51.78	
a) Depreciation					
b) Lease Payments			0.00	0.00	
4. Paid Capital Interest			36,875.00	10.37	
TOTAL CAPITAL COSTS			271,640.11	76.37	0.52
(D) CASH COSTS	(B+C-B18-C3a)		642,157.50	180.51	1.22
(E) TOTAL PRODUCTION COSTS	(B+C)		862,511.36	242.45	1.64
(F) GROSS MARGIN	(A-D)		323,874.00	91.04	0.61
RETURN TO UNPAID LABOUR	(A-E+B18)		139,677.64	39.26	0.26
RETURN TO INVESTMENT	(A-E+C4)	5.6 %	140,395.14	39.46	0.27
RETURN TO EQUITY	(A-E)		103,520.14	29.10	0.20
MANAGEMENT					
Number of Hives				3,558	
Average Yield per Hive (lb.)				148.21	
Honey Produced (lb.)				527,267.50	

Table 33: Pollination Production Enterprise Investment, North-East, North-West and Peace, 2016

INVESTMENT SUMMARY:		Total \$	\$/Hive	
Land	65 acres	156,700.00	44.05	
Buildings		948,875.00	266.73	
Bee Equipment		982,475.00	276.17	
Machinery		413,136.25	116.13	
TOTAL INVESTMENT		2,501,186.25	703.08	
INVESTMENT DETAIL:		Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land		156,700.00		
Honey House		375,000.00	1.07	18,750.00
Wintering Shed		0.00	0.00	0.00
Houses (25%)		100,000.00	10.50	5,000.00
Other Buildings		473,875.00	8.88	23,693.75
Buildings Sub-Total		948,875.00		47,443.75
Hives		538,100.00	5.75	61,881.50
Pallets		22,600.00	4.00	2,599.00
Fork Lift		125,000.00	4.13	10,000.00
Hive Feeders		9,907.50	2.50	1,139.36
Super Elevator		0.00	0.00	0.00
Uncapping Machines		14,500.00	10.25	1,160.00
Honey Extractor		67,500.00	5.25	5,400.00
Dryer/Heat Exchanger		6,250.00	1.25	500.00
Wax Spinner/Separator		14,125.00	7.00	1,130.00
Honey Tank & Pipe		22,500.00	3.25	2,587.50
Feed Tank		10,775.00	5.00	1,239.13
Storage Vessel		0.00	0.00	0.00
Boiler Furnace		10,750.00	6.25	860.00
Water System		0.00	0.00	0.00
Compressor		1,287.50	5.50	103.00
Pressure Washer		6,800.00	2.50	544.00
Fuel Tank		0.00	0.00	0.00
Scales		3,578.75	5.50	411.56
Barrels		20,693.75	1.25	2,379.78
Barrel Loader		0.00	0.00	0.00
Carts		1,332.50	4.75	153.24
Fencers / Shockers		0.00	0.00	0.00
Shop Tools		15,250.00	5.00	1,753.75
Staplers		375.00	2.00	43.13
Office Equipment		0.00	0.00	0.00
Lawn Mower		6,900.00	2.75	552.00
Over-Wintering Insulation		46,750.00	3.75	5,376.25
Miscellaneous Equipment		37,500.00	1.25	3,000.00
Equipment Sub - Total		982,475.00		102,813.20
Trucks		357,250.00	6.41	28,580.00
Tractors		12,500.00	2.00	1,000.00
Other Machinery		43,386.25	4.72	1,440.00
Power Equipment Sub - Total		413,136.25		31,020.00
TOTAL INVESTMENT		2,501,186.25		181,276.95

SECTION VIII

BEE SALES PRODUCTION COSTS AND RETURNS IN ALBERTA, 2016

As previously mentioned in the introduction, seven (7) out of the 47 beekeepers who participated in the 2016 cost of production primarily produced honey and sold bees as queens, nucs, and hives. As shown in Table 34, honey produced for sale by an average study participant was 402,567 pounds. On average, each beekeeper managed 2,094 hives and their average yield per hive was estimated at 192 pounds.

In total, 14 beekeepers reported revenues from selling bees (queens, nucs, and hives); however, based on the proportion of bee sales to total value of production, only seven beekeepers were selected to benchmark the costs and returns for this enterprise. Three out of these seven beekeepers operated 2,500 or more hives and the remaining four operations had less than 1,000 hives.

As shown in Table 34, average revenue from bee sales in these operations account for about six percent of their total value of production. The queens, nucs and hives were sold at approximately \$35, \$150 and \$300 per unit respectively. Readers are advised to note that this analysis is not for operations that only produce and sell bees.

Value of Production:

Average value of honey sales including wax and miscellaneous receipts per beekeeper was estimated at \$618,782 or 296 per hive. Approximately 94 percent of the honey produced was sold as bulk honey. Income from bee sales was estimated at \$37,777 per operation or \$18 per hive. When income from bee sales was added to the value of honey, wax and other receipts, the total value of production amounted to \$656,560 or \$314 per hive or \$1.63 per pound of honey produced. Details on value of production (honey and bee sales) are presented in Table 33.

Variable Costs:

Average variable costs for this group of seven beekeepers was estimated at \$318,762 or \$152 per hive or \$0.79 per pound of honey produced. Paid labour and benefits estimated at \$49 per hive was the leading expense item. This was followed by expenses associated with sugar feeding, unpaid labour, and medicinal sugar/bee repellent.

Capital Costs:

Average capital costs for the seven beekeepers in the bee sales group was estimated at \$122,197 per operation or \$58 per hive. The most significant cost item for this group was equipment and building depreciation at \$49 per hive.

Total Production Costs:

Average total production costs for the group were calculated at \$440,959 per operation. In terms of total production cost per hive, it was \$211 per operation or \$1.154 per pound of honey produced. Details on variable and capital costs are presented in Table 34.

Management Indicators:

Average gross margin for the bee sales group of beekeepers was \$370,678 per operation or \$177 per hive. Return to unpaid labour for this group was positive at \$268,066 per operation (\$128 per hive). Average return to investment and equity were also positive at \$105 and \$103 per hive, respectively. Details on gross margin and return to unpaid labour, investment and equity are presented in Table 34.

Investment Costs:

Land associated with this group was over 190 acres, valued at \$473,143 (\$2,466 per acre) or \$223 per hive. Building investment per study participant was estimated at \$534,929 or \$255 per hive. Bee equipment investment was \$540,397 per average operation or \$258 per hive. Machinery investment was based on the percentage use for the business was estimated at \$218,583 or \$104 per hive. When all of the investment costs were added together, total investment per operation amounted to \$1,767,051 or approximately \$844 per hive. Details on investment costs are presented in Table 35.

Based on the results for Alberta, the bee sales group of beekeepers operated more than double the number of hives, had lower costs and made more money compared with those who produced only honey. In addition, their investment costs were about \$30 per hive higher than those who produced only honey.

Table 34: Bee Sales Production Costs and Returns, 2016

(A)			Total \$	\$/Hive	\$/lb
1. Bulk Honey Sales	377,834.86	lbs	516,894.11	246.88	1.37
2. Bulk Honey Inventory	15,160.71	lbs	21,018.76	10.04	
3. Consumer Pack Sales	1,667.14	lbs	4,902.71	2.34	
4. Consumer Pack Inventory	7,904.29	lbs	16,400.86	7.83	
5. Other Honey Sales	0.00	lbs	0.00	0.00	
6. Wax/Pollen/Other Sales	12,402.43	lbs	59,565.93	28.45	
7. Bee Sales			37,777.14	18.04	
8. Bee/Honey Insurance Receipts			0.00	0.00	
9. Miscellaneous Receipts			0.00	0.00	
10. Less: Honey Purchase for Resale			0.00	0.00	
VALUE OF PRODUCTION			656,559.51	313.59	1.63
(B)					
1. Bee Purchases - Package Bees			0.00	0.00	
2. Bee Purchases - Queens			19,143.14	9.14	
3. Bee Purchases - Nucs			0.00	0.00	
4. Freight & Trucking			6,822.14	3.26	
5. Sugar for Feeding			66,911.57	31.96	
6. Pollen Supplement Feeding			5,864.00	2.80	
7. Medicinal Sugar/Bee Repellent			21,870.86	10.45	
8. Bee/Honey Insurance			4,231.43	2.02	
9. Fuel			16,849.29	8.05	
10. Repairs - Machine			2,808.86	1.34	
11. Repairs - Buildings & Improvements			1,465.00	0.70	
12. Utilities & Heating Fuel			5,914.71	2.82	
13. Custom Work & Machine Rental			2,428.57	1.16	
14. Association Dues, Prof'l Fees, Promotion and Travel			5,702.14	2.72	
15. Small Tools, Supplies & Miscellaneous Expenses			3,546.43	1.69	
16. Operating Interest			1,036.43	0.50	
17. Paid Labour & Benefits	6,064.71	hours	101,701.71	48.57	
18. Unpaid Labour	2,508.57	hours	52,465.71	25.06	
VARIABLE COSTS			318,761.99	152.25	0.79
(C)					
1. Land Rent / Lease, Bldg. Rent & Forage Access			5,526.43	2.64	
2. Taxes, Licences & General Insurance			9,932.00	4.74	
3. Equipment & Building a) Depreciation			102,611.41	49.01	
b) Lease Payments			0.00	0.00	
4. Paid Capital Interest			4,127.00	1.97	
TOTAL CAPITAL COSTS			122,196.84	58.36	0.30
(D) CASH COSTS	(B+C-B18-C3a)		285,881.71	136.54	0.71
(E) TOTAL PRODUCTION COSTS	(B+C)		440,958.83	210.61	1.10
(F) GROSS MARGIN	(A-D)		370,677.80	177.04	0.92
RETURN TO UNPAID LABOUR	(A-E+B18)		268,066.39	128.03	0.67
RETURN TO INVESTMENT	(A-E+C4)	12.4 %	219,727.68	104.95	0.55
RETURN TO EQUITY	(A-E)		215,600.68	102.98	0.54
MANAGEMENT					
Number of Hives				2,094	
Average Yield per Hive (lb.)				192.27	
Honey Produced (lb.)				402,567.00	

Table 35: Bee Sales Production Enterprise Investment, 2016

INVESTMENT SUMMARY:		Total \$	\$/Hive	
Land	191.86 acres	473,142.86	225.98	
Buildings		534,928.57	255.49	
Bee Equipment		540,396.64	258.10	
Machinery		218,582.86	104.40	
TOTAL INVESTMENT		1,767,050.93	843.97	
INVESTMENT DETAIL:		Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land		473,142.86		
Honey House		123,571.43	12.71	6,178.57
Wintering Shed		0.00	0.00	0.00
Houses (25%)		85,714.29	36.00	4,285.71
Other Bldgs		325,642.86	15.96	16,282.14
Buildings Sub-Total		534,928.58		26,746.42
Hives		242,492.86	15.00	27,886.68
Pallets		11,648.57	11.29	1339.59
Fork Lift		50,571.43	8.63	4,045.71
Hive Feeders		27,985.71	11.43	3218.36
Super Elevator		0.00	0.00	0.00
Uncapping Machines		18,500.00	13.14	1480.00
Honey Extractor		27,142.86	15.86	2,171.43
Dryer/Heat Exchanger		2,571.43	1.29	205.71
Wax Spinner/Separator		10,142.86	8.71	811.43
Honey Tank & Pipe		8,785.71	17.29	1010.36
Feed Tank		4,685.71	7.14	538.86
Storage Vessel		0.00	0.00	0.00
Boiler Furnace		3,214.29	8.29	257.14
Water System		0.00	0.00	0.00
Compressor		1185.71	13.57	94.86
Pressure Washer		1,845.71	6.43	147.66
Fuel Tank		0.00	0.00	0.00
Scales		1,075.57	10.00	123.69
Barrels		9,022.86	4.86	1037.63
Barrel Loader		0.00	0.00	0.00
Carts		857.14	7.00	98.57
Fencers / Shockers		2392.86	2.43	275.18
Shop Tools		9,714.29	5.86	1,117.14
Staplers		230.71	2.86	26.53
Office Equipment		0.00	0.00	0.00
Lawn Mower		11,258.93	4.86	900.71
Over-Wintering Insulation		43,942.86	7.14	5053.43
Miscellaneous Equipment		51,128.57	0.70	5804.79
Equipment Sub - Total		540,396.64		57,645.46
Trucks		187,642.86	12.42	15,011.43
Tractors		4285.71	3.57	342.86
Other Machinery		26,654.29	6.37	457.14
Power Equipment Sub - Total		218,582.86		15,811.43
TOTAL INVESTMENT		1,767,050.94		100,203.31

APPENDICES

Appendix 1: Honey Production Costs and Returns, Alberta, 2011

(A)		Total \$	\$/Hive	\$/lb
1. Bulk Honey Sales	144,379.82 lb	225,162.46	204.71	1.56
2. Bulk Honey Inventory	2,766.50 lb	4,310.57	3.92	
3. Consumer Pack Sales	4,067.86 lb	12,053.35	10.96	
4. Consumer Pack Inventory	6,829.07 lb	10,502.04	9.55	
5. Other Honey Sales	179.71 lb	202.24	0.18	
6. Wax/Pollen/Other Sales	2,825.86 lb	9,152.11	8.32	
7. Bee Sales		0.00	0.00	
8. Crop Insurance Receipts		13,347.50	12.13	
9. Miscellaneous Receipts		1,693.00	1.54	
10. Less: Honey Purchase for Resale		22,285.71	20.26	
VALUE OF PRODUCTION		298,708.98	271.57	1.89
(B)				
1. Bee Purchases - Package Bees		1,377.50	1.25	
2. Bee Purchases - Queens		8,491.43	7.72	
3. Bee Purchases - Nucs		1,757.14	1.60	
4. Freight and Trucking		4,748.10	4.32	
5. Sugar for Feeding		30,190.62	27.45	
6. Pollen Supplement Feeding		1,433.14	1.30	
7. Medicinal Sugar/Bee Repellent		8,810.47	8.01	
8. Product and Crop Insurance		4,517.79	4.11	
9. Fuel		13,671.48	12.43	
10. Repairs - Machine		10,136.22	9.22	
11. Repairs - Buildings and Improvements		3,973.47	3.61	
12. Utilities and Heating Fuel		7,626.06	6.93	
13. Custom Work and Machine Rental		1,459.43	1.33	
14. Assoc. Dues, Prof'l Fees, Promotion and Travel		6,106.56	5.55	
15. Small Tools, Supplies and Miscellaneous Expenses		13,283.75	12.08	
16. Operating Interest		2,645.50	2.41	
17. Paid Labour and Benefits	2,525.27 hours	39,730.91	36.12	
18. Unpaid Labour	1,247.43 hours	13,098.00	11.91	
VARIABLE COSTS		173,057.57	157.34	1.09
(C)				
1. Land Rent/Lease, Bldg. Rent and Forage Access		3,050.64	2.77	
2. Taxes, Licences and General Insurance		11,767.32	10.70	
3. Equipment and Building a) Depreciation		60,047.19	54.59	
b) Lease Payments		0.00	0.00	
4. Paid Capital Interest		5,169.46	4.70	
TOTAL CAPITAL COSTS		80,034.61	72.76	0.51
(D)	CASH COSTS (B+C-B18-C3a)	179,946.99	163.60	1.14
(E)	TOTAL PRODUCTION COSTS (B+C)	253,092.18	230.10	1.60
(F)	GROSS MARGIN (A-D)	118,761.99	107.97	0.75
	RETURN TO UNPAID LABOUR (A-E+B18)	58,714.80	53.38	0.37
	RETURN TO INVESTMENT (A-E+C4) 8.5%	50,786.26	46.17	0.32
	RETURN TO EQUITY (A-E)	45,616.80	41.47	0.29
MANAGEMENT				
	Number of Hives		1,099.93	
	Average Yield per Hive (lb.)		143.85	
	Honey Produced (lb.)		158,222.97	

Source: Table 2, 2011 Report

Appendix 2: Honey Production Enterprise Investment, Alberta, 2011

INVESTMENT SUMMARY:		Total \$	\$/Hive	
Land	19.57 acres	24,419.64	22.20	
Buildings		154,527.68	140.49	
Bee Equipment		386,088.50	351.01	
Machinery		104,175.86	94.71	
TOTAL INVESTMENT		669,211.68	608.41	
INVESTMENT DETAIL:		Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land		24,419.64		
Honey House		115,228.57	14.50	5,761.43
Wintering Shed		0.00	0.00	0.00
Houses (25%)		19,888.39	21.07	994.42
Other Buildings		19,410.71	17.59	970.54
Buildings Sub-Total		154,527.67		7,726.39
Hives		257,275.00	10.60	29,586.63
Pallets		22,842.43	7.75	2,626.88
Fork Lift		1,892.86	1.64	151.43
Hive Feeders		6,162.86	7.71	708.73
Super Elevator		0.00	0.00	0.00
Uncapping Machines		8,194.79	8.43	655.58
Honey Extractor		19,414.29	14.29	1,553.14
Dryer/Heat Exchanger		964.29	1.93	77.14
Wax Spinner/Separator		4,750.00	8.64	380.00
Honey Tank and Pipe		8,642.86	13.11	993.93
Feed Tank		3,939.29	10.00	453.02
Storage Vessel		0.00	0.00	0.00
Boiler Furnace		1,907.14	8.14	152.57
Water System		0.00	0.00	0.00
Compressor		489.29	6.55	39.14
Pressure Washer		2,314.29	5.36	185.14
Fuel Tank		0.00	0.00	0.00
Scales		1,217.86	10.07	140.05
Barrels		3,347.07	2.29	384.91
Barrel Loader		0.00	0.00	0.00
Carts		596.43	8.00	68.59
Fencers/Shockers		1,182.43	13.75	135.98
Shop Tools		5,807.14	6.29	667.82
Staplers		440.00	3.64	50.60
Office Equipment		0.00	0.00	0.00
Lawn Mower		3,257.86	4.46	260.63
Over-Wintering Insulation		6,771.79	4.07	778.76
Miscellaneous Equipment		24,678.57	13.41	1,974.29
Equipment Sub - Total		386,088.54		42,024.96
Trucks		44,614.29	8.90	3,569.14
Tractors		0.00	0.00	0.00
Other Machinery		59,561.57	8.68	280.86
Power Equipment Sub - Total		104,175.86		3,850.00
TOTAL INVESTMENT		669,211.71		53,601.35

Source: Table 3, 2011 Report

Appendix 3: Honey Production Costs and Returns, by Size (up to 1,000 Hives), 2011

(A)			Total \$	\$/Hive	\$/lb
1. Bulk Honey Sales	66,011.17 lb		105,827.76	213.60	1.56
2. Bulk Honey Inventory	4303.44 lb		6,705.34	13.53	
3. Consumer Pack Sales	6,327.78 lb		18,749.65	37.84	
4. Consumer Pack Inventory	2,013.00 lb		2,130.00	4.30	
5. Other Honey Sales	279.56 lb		314.60	0.63	
6. Wax/Pollen/Other Sales	1985.11 lb		8,927.78	18.02	
7. Bee Sales			0.00	0.00	
8. Crop Insurance Receipts			1,849.89	3.73	
9. Miscellaneous Receipts			2,570.23	5.19	
10. Less: Honey Purchase for Resale			0.00	0.00	
VALUE OF PRODUCTION			147,075.25	296.86	1.86
(B)					
1. Bee Purchases - Package Bees			2,142.78	4.33	
2. Bee Purchases - Queens			4,551.56	9.19	
3. Bee Purchases - Nucs			1,233.33	2.49	
4. Freight and Trucking			3,391.04	6.84	
5. Sugar for Feeding			12,773.96	25.78	
6. Pollen Supplement Feeding			310.00	0.63	
7. Medicinal Sugar/Bee Repellent			4,746.72	9.58	
8. Product and Crop Insurance			2,927.67	5.91	
9. Fuel			7,047.08	14.22	
10. Repairs - Machine			6,839.79	13.81	
11. Repairs - Buildings and Improvements			2,616.40	5.28	
12. Utilities and Heating Fuel			5,186.98	10.47	
13. Custom Work and Machine Rental			1,064.11	2.15	
14. Assoc. Dues, Prof'l Fees, Promotion and Travel			2,844.31	5.74	
15. Small Tools, Supplies and Miscellaneous Expenses			11,132.40	22.47	
16. Operating Interest			931.11	1.88	
17. Paid Labour and Benefits	897.61 hours		13,772.67	27.80	
18. Unpaid Labour	1,171.56 hours		12,301.38	24.83	
VARIABLE COSTS			95,813.29	193.39	1.21
(C)					
1. Land Rent/Lease, Bldg. Rent and Forage Access			1,136.00	2.29	
2. Taxes, Licences and General Insurance			6,730.94	13.59	
3. Equipment and Building			29,541.49	59.63	
a) Depreciation					
b) Lease Payments			0.00	0.00	
4. Paid Capital Interest			2,880.72	5.81	
TOTAL CAPITAL COSTS			40,289.15	81.32	0.51
(D)	CASH COSTS	(B+C-B18-C3a)	94,259.57	190.25	1.19
(E)	TOTAL PRODUCTION COSTS	(B+C)	136,102.44	274.71	1.72
(F)	GROSS MARGIN	(A-D)	52,815.68	106.60	0.67
	RETURN TO UNPAID LABOUR	(A-E+B18) 4.1%	23,274.19	46.98	0.29
	RETURN TO INVESTMENT	(A-E+C4)	13,853.53	27.96	0.18
	RETURN TO EQUITY	(A-E)	10,972.81	22.15	0.14
MANAGEMENT					
	Number of Hives			495.44	
	Average Yield per Hive (lb.)			159.32	
	Honey Produced (lb.)			78,934.95	

Source: Table 10, 2011 Report

Appendix 4: Honey Production Enterprise Investment, by Size (up to 1,000 Hives), 2011

INVESTMENT SUMMARY:		Total \$	\$/Hive
Land	12.56 acres	13,597.22	27.44
Buildings		87,269.44	176.15
Bee Equipment		194,628.33	392.84
Machinery		45,173.56	91.18
TOTAL INVESTMENT		340,668.55	687.61

INVESTMENT DETAIL:	Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land	13,597.22		
Honey House	53,133.33	12.00	2,656.67
Wintering Shed	0.00	0.00	0.00
Houses (25%)	20,347.22	21.22	1,017.36
Other Buildings	13,788.89	12.58	689.44
Buildings Sub-Total	87,269.44		4,363.47
Hives	128,044.44	11.44	14,725.11
Pallets	1,893.78	7.78	217.78
Fork Lift	1,555.56	1.78	124.44
Hive Feeders	5,497.78	7.33	632.24
Super Elevator	0.00	0.00	0.00
Uncapping Machines	8,080.78	8.22	646.46
Honey Extractor	9,533.33	15.67	762.67
Dryer/Heat Exchanger	0.00	0.00	0.00
Wax Spinner/Separator	1,722.22	7.56	137.78
Honey Tank and Pipe	3,777.78	13.11	434.44
Feed Tank	1,183.33	11.56	136.08
Storage Vessel	0.00	0.00	0.00
Boiler Furnace	1,577.78	6.33	126.22
Water System	0.00	0.00	0.00
Compressor	222.22	6.67	17.78
Pressure Washer	1,688.89	5.67	135.11
Fuel Tank	0.00	0.00	0.00
Scales	661.11	10.22	76.03
Barrels	763.89	2.67	87.85
Barrel Loader	0.00	0.00	0.00
Carts	494.44	7.67	56.86
Fencers/Shockers	900.44	21.11	103.55
Shop Tools	4,033.33	6.89	463.83
Staplers	351.11	4.00	40.38
Office Equipment	0.00	0.00	0.00
Lawn Mower	1,484.44	5.22	118.76
Over-Wintering Insulation	6,883.89	4.67	791.65
Miscellaneous Equipment	14,277.78	12.92	1,142.22
Equipment Sub - Total	194,628.32		20,977.24
Trucks	24,677.78	9.50	1,974.22
Tractors	0.00	0.00	0.00
Other Machinery	20,495.78	6.78	298.22
Power Equipment Sub - Total	45,173.56		2,272.44
TOTAL INVESTMENT		340,668.54	27,613.15

Source: Table 11, 2011 Report

Appendix 5: Honey Production Costs and Returns, by Size (over 1,000 Hives), 2011

		Total \$	\$/Hive	\$/lb
(A)				
1. Bulk Honey Sales	285,443.40 lb	439,964.92	201.08	1.54
2. Bulk Honey Inventory	0.00 lb	0.00	0.00	
3. Consumer Pack Sales	0.00 lb	0.00	0.00	
4. Consumer Pack Inventory	15,498.00 lb	25,571.70	11.69	
5. Other Honey Sales	0.00 lb	0.00	0.00	
6. Wax/Pollen/Other Sales	4,339.20 lb	9,555.92	4.37	
7. Bee Sales		0.00	0.00	
8. Crop Insurance Receipts		34,043.20	15.56	
9. Miscellaneous Receipts		114.00	0.05	
10. Less: Honey Purchase for Resale		62,400.00	28.52	
VALUE OF PRODUCTION		571,649.74	261.27	1.90
(B)				
1. Bee Purchases - Package Bees		0.00	0.00	
2. Bee Purchases - Queens		15,583.20	7.12	
3. Bee Purchases - Nucs		2,700.00	1.23	
4. Freight and Trucking		7,190.80	3.29	
5. Sugar for Feeding		61,540.60	28.13	
6. Pollen Supplement Feeding		3,454.80	1.58	
7. Medicinal Sugar/Bee Repellent		16,125.20	7.37	
8. Product and Crop Insurance		7,380.00	3.37	
9. Fuel		25,595.40	11.70	
10. Repairs - Machine		16,069.80	7.34	
11. Repairs - Buildings and Improvements		6,416.20	2.93	
12. Utilities and Heating Fuel		12,016.40	5.49	
13. Custom Work and Machine Rental		2,171.00	0.99	
14. Assoc. Dues, Prof'l Fees, Promotion and Travel		11,978.60	5.47	
15. Small Tools, Supplies and Miscellaneous Expenses		17,156.20	7.84	
16. Operating Interest		5,731.40	2.62	
17. Paid Labour and Benefits	5,455.06 hours	86,455.75	39.51	
18. Unpaid Labour	1,384.00 hours	14,532.00	6.64	
VARIABLE COSTS		312,097.35	142.64	1.04
(C)				
1. Land Rent/Lease, Bldg. Rent and Forage Access		6,497.00	2.97	
2. Taxes, Licences and General Insurance		20,832.80	9.52	
3. Equipment and Building a) Depreciation		114,957.46	52.54	
b) Lease Payments		0.00	0.00	
4. Paid Capital Interest		9,289.20	4.25	
TOTAL CAPITAL COSTS		151,576.46	69.28	0.50
(D) CASH COSTS	(B+C-B18-C3a)	334,184.35	152.74	1.11
(E) TOTAL PRODUCTION COSTS	(B+C)	463,673.81	211.92	1.54
(F) GROSS MARGIN	(A-D)	237,465.39	108.53	0.79
RETURN TO UNPAID LABOUR	(A-E+B18)	122,507.93	55.99	0.41
RETURN TO INVESTMENT	(A-E+C4) 10.6%	117,265.13	53.59	0.39
RETURN TO EQUITY	(A-E)	107,975.93	49.35	0.36
MANAGEMENT				
Number of Hives			2,188.000	
Average Yield per Hive (lb.)			137.540	
Honey Produced (lb.)			300,941.400	

Source: Table 12, 2011 Report

Appendix 6: Honey Production Enterprise Investment, by Size (over 1,000 Hives), 2011

INVESTMENT SUMMARY:		Total \$	\$/Hive	
Land	32.20 acres	43,900.00	20.06	
Buildings		275,592.50	125.96	
Bee Equipment		730,716.80	333.97	
Machinery		210,380.00	96.15	
TOTAL INVESTMENT		1,260,589.30	576.14	
INVESTMENT DETAIL:		Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land		43,900.00		
Honey House		227,000.00	19.00	11,350.00
Wintering Shed		0.00	0.00	0.00
Houses (25%)		19,062.50	20.80	953.13
Other Buildings		29,530.00	26.60	1,476.50
Buildings Sub-Total		275,592.50		13,779.63
Hives		489,890.00	9.09	56,337.35
Pallets		60,550.00	7.70	6,963.25
Fork Lift		2,500.00	1.40	200.00
Hive Feeders		7,360.00	8.40	846.40
Super Elevator		0.00	0.00	0.00
Uncapping Machines		8,400.00	8.80	672.00
Honey Extractor		37,200.00	11.80	2,976.00
Dryer/Heat Exchanger		2,700.00	5.40	216.00
Wax Spinner/Separator		10,200.00	10.60	816.00
Honey Tank and Pipe		17,400.00	13.10	2,001.00
Feed Tank		8,900.00	7.20	1,023.50
Storage Vessel		0.00	0.00	0.00
Boiler Furnace		2,500.00	11.40	200.00
Water System		0.00	0.00	0.00
Compressor		970.00	6.33	77.60
Pressure Washer		3,440.00	4.80	275.20
Fuel Tank		0.00	0.00	0.00
Scales		2,220.00	9.80	255.30
Barrels		7,996.80	1.60	919.63
Barrel Loader		0.00	0.00	0.00
Carts		780.00	8.60	89.70
Fencers/Shockers		1,690.00	0.50	194.35
Shop Tools		9,000.00	5.20	1,035.00
Staplers		600.00	3.00	69.00
Office Equipment		0.00	0.00	0.00
Lawn Mower		6,450.00	3.10	516.00
Over-Wintering Insulation		6,570.00	3.00	755.55
Miscellaneous Equipment		43,400.00	14.30	3,472.00
Equipment Sub - Total		730,716.80		79,910.83
Trucks		80,500.00	7.81	6,440.00
Tractors		0.00	0.00	0.00
Other Machinery		129,880.00	12.11	249.60
Power Equipment Sub - Total		210,380.00		6,689.60
TOTAL INVESTMENT		1,260,589.30		100,380.06

Source: Table 13, 2011 Report

Appendix 7: Pollination Production Costs and Returns, Alberta, 2011

(A)		Total \$	\$/Hive	\$/lb
1. Bulk Honey Sales	308,491.71 lb	476,564.07	130.31	1.54
2. Bulk Honey Inventory	29,028.57 lb	43,542.86	11.91	
3. Consumer Pack Sales	2,442.86 lb	6,148.57	1.68	
4. Consumer Pack Inventory	83,071.43 lb	125,760.71	34.39	
5. Other Honey Sales	214.29 lb	428.57	0.12	
6. Wax/Pollen/Other Sales	14,123.71 lb	63,271.17	17.30	
7. Bee Sales		0.00	0.00	
8. Crop Insurance Receipts		10,285.71	2.81	
9. Miscellaneous Receipts		435.57	0.12	
10. Less: Honey Purchase for Resale		0.00	0.00	
11. Hive Rental - Pollination		378,662.86	154.07	
VALUE OF PRODUCTION		1,105,100.09	302.18	2.61
(B)				
1. Bee Purchases - Package Bees		36,234.11	9.91	0.09
2. Bee Purchases - Queens		50,960.71	13.93	0.12
3. Bee Purchases - Nucs		9,285.71	2.54	0.02
4. Freight and Trucking		10,327.57	2.82	0.02
5. Sugar for Feeding		76,411.29	20.89	0.18
6. Pollen Supplement Feeding		12,583.43	3.44	0.03
7. Medicinal Sugar/Bee Repellent		30,561.29	8.36	0.07
8. Product and Crop Insurance		13,264.29	3.63	0.03
9. Fuel		32,617.14	8.92	0.08
10. Repairs - Machine		17,807.71	4.87	0.04
11. Repairs - Buildings and Improvements		11,223.29	3.07	0.03
12. Utilities and Heating Fuel		16,198.86	4.43	0.04
13. Custom Work and Machine Rental		5,378.14	1.47	0.01
14. Assoc. Dues, Prof'l Fees, Promotion and Travel		19,954.50	5.46	0.05
15. Small Tools, Supplies and Miscellaneous Expenses		35,356.43	9.67	0.08
16. Operating Interest		3,946.43	1.08	0.01
17. Paid Labour and Benefits	10,339.57 hours	164,422.86	44.96	0.39
18. Unpaid Labour	2,798.57 hours	29,385.00	8.03	0.07
VARIABLE COSTS		575,918.76	157.48	1.36
(C)				
1. Land Rent/Lease, Bldg. Rent and Forage Access		9,886.57	2.70	0.02
2. Taxes, Licences and General Insurance		15,802.71	4.32	0.04
3. Equipment and Building a) Depreciation		200,558.55	54.84	0.47
b) Lease Payments		0.00	0.00	0.00
4. Paid Capital Interest		21,410.14	5.85	0.05
TOTAL CAPITAL COSTS		247,657.97	67.72	0.59
(D) CASH COSTS	(B+C-B18-C3a)	593,633.18	162.32	1.40
(E) TOTAL PRODUCTION COSTS	(B+C)	823,576.73	225.20	1.95
(F) GROSS MARGIN	(A-D)	511,466.91	139.85	1.21
RETURN TO UNPAID LABOUR	(A-E+B18)	310,908.36	85.01	0.73
RETURN TO INVESTMENT	(A-E+C4) 6.30%	302,933.50	82.83	0.72
RETURN TO EQUITY	(A-E)	281,523.36	76.98	0.67
MANAGEMENT				
Number of Hives			3,657.14	
Average Yield per Hive (lb.)			115.73	
Honey Produced (lb.)			423,248.86	

Source: Table 15, 2011 Report

Appendix 8: Pollination Production Enterprise Investment, Alberta, 2011

INVESTMENT SUMMARY:		Total \$	\$/Hive	
Land	41.71 acres	62,571.43	17.11	
Buildings		364,928.57	99.79	
Bee Equipment		1,271,328.57	347.63	
Machinery		442,118.57	120.89	
TOTAL INVESTMENT		2,140,947.14	585.42	
INVESTMENT DETAIL:		Enterprise Value (\$)	Age (Years)	Depreciation (\$)
Land		62,571.43		
Honey House		177,142.86	11.57	8,857.14
Wintering Shed		0.00	0.00	0.00
Houses (25%)		35,357.14	12.71	1,767.86
Other Buildings		152,428.57	17.80	7,621.43
Buildings Sub-Total		364,928.57		18,246.43
Hives		942,142.86	11.71	108,346.43
Pallets		35,842.86	6.14	4,121.93
Fork Lift		12,857.14	3.73	1,028.57
Hive Feeders		32,500.00	5.57	3,737.50
Super Elevator		0.00	0.00	0.00
Uncapping Machines		9,500.00	8.86	760.00
Honey Extractor		31,428.57	8.57	2,514.29
Dryer/Heat Exchanger		6,214.29	4.57	497.14
Wax Spinner/Separator		17,857.14	4.79	1,428.57
Honey Tank and Pipe		13,228.57	9.00	1,521.29
Feed Tank		5,200.00	9.14	598.00
Storage Vessel		0.00	0.00	0.00
Boiler Furnace		4,928.57	4.14	394.29
Water System		0.00	0.00	0.00
Compressor		1,121.43	3.57	89.71
Pressure Washer		1,857.14	7.43	148.57
Fuel Tank		0.00	0.00	0.00
Scales		2,914.29	7.71	335.14
Barrels		11,785.71	2.00	1,355.36
Barrel Loader		0.00	0.00	0.00
Carts		414.29	6.43	47.64
Fencers/Shockers		2,428.57	1.71	279.29
Shop Tools		14,071.43	7.57	1,618.21
Staplers		564.29	2.86	64.89
Office Equipment		0.00	0.00	0.00
Lawn Mower		8,842.86	4.00	707.43
Over-Wintering Insulation		39,914.29	5.43	4,590.14
Miscellaneous Equipment		75,714.29	10.43	6,057.14
Equipment Sub - Total		1,271,328.57		140,241.54
Trucks		228,680.00	7.16	18,294.40
Tractors		0.00	0.00	0.00
Other Machinery		213,438.57	7.07	1,792.57
Power Equipment Sub - Total		442,118.57		20,086.97
TOTAL INVESTMENT		2,140,947.14		178,574.94

Source: Table 16, 2011 Report

Appendix 9: Summary of Honey Production Costs and Returns by Regions and Size, 2011

	ALBERTA		REGION						SIZE OF OPERATION			
			SOUTH, CENTRAL AND NORTH-EAST		NORTH-WEST		PEACE RIVER		UP TO 1,000 HIVES		OVER 1,000 HIVES	
Number of Producers	14		3		5		6		9		5	
Average Number of Hives	1,100		1,149		1,022		1,140		495		2,188	
Average Yield Per Hive (lb.)	144		151.3		149.6		136		159		138	
Honey Produced (lb.)	158,223		173,827		152,837		154,909		78,935		300,941	
	\$/Hive	\$/lb	\$/Hive	\$/lb	\$/Hive	\$/lb	\$/Hive	\$/lb	\$/Hive	\$/lb	\$/Hive	\$/lb
Bulk Honey Sales	204.71	1.42	227.40	1.50	222.38	1.49	180.08	1.33	213.60	1.34	201.08	1.46
Other Honey Sales/Inventory*	32.93	0.23	13.31	0.09	33.68	0.23	42.26	0.31	74.33	0.47	16.05	0.12
Miscellaneous Income**	33.93	0.24	0.18	0.00	62.98	0.42	29.25	0.22	8.92	0.06	44.13	0.32
TOTAL VALUE OF PRODUCTION	271.57	1.89	240.89	1.59	319.04	2.13	251.59	1.85	296.86	1.86	261.27	1.90
Feed - Sugar	27.45	0.19	27.23	0.18	27.66	0.18	27.40	0.20	25.78	0.16	28.13	0.20
Hired Labour	36.12	0.25	32.03	0.21	41.66	0.28	34.05	0.25	27.80	0.17	39.51	0.29
Operator and Family Labour	11.91	0.08	11.26	0.07	12.07	0.08	12.12	0.09	24.83	0.16	6.64	0.05
Other Variable Costs	81.86	0.57	71.34	0.47	81.48	0.54	87.44	0.64	114.98	0.72	68.36	0.50
Total Capital Costs	72.76	0.51	48.97	0.32	80.18	0.54	79.21	0.58	81.32	0.51	69.28	0.50
TOTAL CASH COSTS	163.60	1.14	143.82	0.95	170.03	1.14	168.76	1.24	190.25	1.19	152.74	1.11
TOTAL PRODUCTION COSTS	230.10	1.60	190.83	1.26	243.05	1.63	240.21	1.77	274.71	1.72	211.92	1.54
GROSS MARGIN	107.97	0.75	97.07	0.64	149.00	1.00	82.83	0.61	106.60	0.67	108.53	0.79
RETURN TO UNPAID LABOUR	53.38	0.37	61.32	0.41	88.05	0.59	23.49	0.17	46.98	0.29	55.99	0.41
RETURN TO INVESTMENT	46.17	0.32	57.37	0.38	81.78	0.55	13.94	0.10	27.96	0.18	53.59	0.39
RETURN TO EQUITY	41.47	0.29	50.06	0.33	75.98	0.51	11.38	0.08	22.15	0.14	49.35	0.36
Average Investment Per Hive (\$)	608.41	4.23	562.94	3.72	659.21	4.41	593.39	4.37	687.61	4.32	576.14	4.19
* Includes consumer pack sales, honey inventory and wax/pollen/other sales												
** Includes crop insurance and miscellaneous receipts												

Source: Table 14, 2011 Report