
Economics of beekeeping in Alberta 2022



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Emmanuel Anum Laate

Contents

- Executive summary..... 7**
- SECTION I 8**
- Introduction 8**
- Objectives of the study..... 8**
- The study sample..... 8**
- Method of analysis..... 11**
 - Total value of honey: 11
 - Total value of production: 11
 - Variable costs:..... 12
 - Cash costs: 12
 - Total production costs: 12
 - Management indicators: 12
- SECTION II 13**
- Overview of Alberta’s beekeeping industry..... 13**
 - Number of beekeepers..... 14
 - Number of honey bee colonies..... 14
 - Honey production 15
 - Average yield per colony 16
 - Honey prices 16
 - Honey farm cash receipts..... 17
 - Honey bee imports 17
- SECTION III 19**
- Honey production costs and returns in Alberta, 2022 19**
- SECTION IV..... 23**
- Honey production costs and returns by region, 2022..... 23**
 - Group I (honey production costs and returns, southern region): 24
 - Group II (Honey production costs and returns, central region): 27
 - Group III (Honey production costs and returns, northeast region):..... 30
 - Group IV (Honey production costs and returns, northwest region):..... 33
 - Group V (Honey production costs and returns, peace region): 36
- SECTION V 39**
- Honey production costs and returns by size of operation, 2022 39**
 - Group VI (5 to 1,000 hives): 39
 - Group VII (400 to 1,000 hives): 42
 - Group VIII (100 to 399 hives): 45
 - Group IX (Less than 100 hives):..... 48

Group X (More than 1,000 hives):	51
SECTION VI	54
Summary of honey production costs and returns by region and size of operation	54
Efficiency of resource use by honey producers	59
SECTION VII	61
Pollination production costs and returns in Alberta, 2022	61
Pollination production costs and returns - Southern and central region:	65
Pollination production costs and returns – Northeast, northwest and peace region:	68
SECTION VIII	71
Bee sales production costs and returns in Alberta, 2022	71

List of figures

Figure 1: Distribution of study participants by region.....	9
Figure 2: Number of beekeepers in Alberta and Canada, 2003-2022	14
Figure 3: Number of honey bee colonies in Alberta and Canada, 2003-2022	15
Figure 4: Average number of colonies per beekeeper in Alberta and Canada, 2003-2022	15
Figure 5: Honey production by quantity in Alberta and Canada, 2003-2022	16
Figure 6: Average yield per colony in Alberta and Canada, 2003-2022	16
Figure 7: Honey prices in Alberta - dollars per pound, 2003 - 2022	17
Figure 8: Honey farm cash receipts in Alberta, 2003 - 2022	17
Figure 9: Alberta imports of live queen bees by value (2013 – 2022).....	18
Figure 10: Canada imports of package honey bees by value (2013 – 2022)	18
Figure 11: Distribution of honey study participants by region.....	23
Figure 12: Honey production costs and returns by region and size, 2022 (dollars per hive)	58

List of tables

Table 1: Breakdown of study participants by region, number of colonies and total honey produced	10
Table 2: Breakdown of study sample by type of enterprise	10
Table 3: Breakdown of study sample by size of beekeeping operation.....	10
Table 4: Classification of beekeeping enterprise by region and size of operation	11
Table 5: Historical data on Alberta’s beekeeping industry, 2003 – 2022	13
Table 6: Honey production costs and returns, Alberta, 2022.....	20
Table 7: Honey production enterprise investment, Alberta, 2022.....	22

Table 8: Honey production costs and returns, southern region, 2022	25
Table 9: Honey production enterprise investment, southern region, 2022	26
Table 10: Honey production costs and returns, central region, 2022	28
Table 11: Honey production enterprise investment, central region, 2022.....	29
Table 12: Honey production costs and returns, northeast region, 2022	31
Table 13: Honey production enterprise investment, northeast region, 2022	32
Table 14: Honey production costs and returns, northwest region, 2022	34
Table 15: Honey production enterprise investment, northwest region, 2022.....	35
Table 16: Honey production costs and returns, peace region, 2022	37
Table 17: Honey production enterprise investment, peace region, 2022.....	38
Table 18: Honey production costs and returns by size (5 to 1,000 hives), 2022	40
Table 19: Honey production enterprise investment by size (5 to 1,000 hives), 2022	41
Table 20: Honey production costs and returns by size (400 to 1,000 hives), 2022	43
Table 21: Honey production enterprise investment, by size (400 to 1,000 hives), 2022	44
Table 22: Honey production costs and returns by size (100 to 399 hives), 2022	46
Table 23: Honey production enterprise investment by size (100 to 399 hives), 2022	47
Table 24: Honey production costs and returns by size (Less than 100 hives), 2022.....	49
Table 25: Honey production enterprise investment by size (Less than 100 hives), 2022.....	50
Table 26: Honey production costs and returns by size (More than 1,000 hives), 2022.....	52
Table 27: Honey production enterprise investment by size (More than 1,000 hives), 2022	53
Table 28: Summary of honey production costs and returns by region, 2022.....	56
Table 29: Summary of honey production costs and returns by size of operation, 2022	57
Table 30: Multiple regression statistics (non-linear model).....	59
Table 31: Pollination production costs and returns, Alberta, 2022	63
Table 32: Pollination production enterprise investment, Alberta, 2022.....	64
Table 33: Pollination production costs and returns - southern and central region, 2022	66
Table 34: Pollination production enterprise investment - southern and central region, 2022	67
Table 35: Pollination production costs and returns - northeast, northwest and peace, 2022.....	69
Table 36: Pollination production enterprise investment - northeast, northwest and peace, 2022.....	70
Table 37: Bee sales production costs and returns, 2022.....	72
Table 38: Bee sales production enterprise investment, 2022.....	73

Executive summary

The beekeeping sector is a vital component of the agricultural industry in Alberta. Costs and returns for beekeeping in Alberta have been monitored by the Economics Section of Alberta Agriculture and Irrigation since the early 1970s. In winter 2022-2023, 71 beekeepers across the province were surveyed to obtain their 2022 production costs and returns information. 57 out of these 71 beekeepers produced only honey, nine (9) primarily rented their hives for pollination and extracted honey as well and the remaining five (5) primarily produced honey and sold bees as queens, bee nucs and hives. The largest beekeeper in the study sample operated 14,000 hives and the smallest had five hives. These 71 beekeepers managed a total of 112,423 colonies, representing 37 per cent of Alberta's total number of colonies in 2022.

This report provides details on total value of production (bulk honey sales, other honey sales and inventory and miscellaneous income) for the three beekeeping enterprises (honey, pollination and bee sales). It also provides estimates of cash costs, operator and family labour, capital costs and management indicators (gross margin, return to unpaid labour, return to investment and return to equity).

The report also contains historical data and trends on number of beekeepers, number of colonies, colonies per beekeeper, honey production, honey prices and farm cash receipts in Alberta and Canada over the past 20 years (i.e., from 2003 to 2022). In addition, it provides statistics on honey and bee exports and imports.

The report shows a comparison of honey production costs and returns for the study sample of 57 honey producers by region and by size of operation. All the management indicators estimated were positive for the study sample of 57 honey producers. Only the gross margins (gross revenue less cash costs) were positive for all the various groups classified by region and by size of operation.

A multiple regression was conducted using the data from the 57 honey participants 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 a-priori expectations for sugar feeding costs, 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 of these honey producers.

The regression results show that all the variables conformed to the positive a-priori expectations. Number of hives operated was significant at all levels of significance (one per cent, five per cent and 10 per cent) with an elasticity of 0.56. This means that a one per cent increase in number of hives will correspondingly increase the total value of production by 0.56 per cent. This high percentage increase relative to other variables suggests that number of hives operated is an important factor of honey production in Alberta *ceteris paribus* (i.e., holding other variables constant). Total variable costs were also found to be significant at both the five and 10 per cent levels with an elasticity of 0.46 but not at the one per cent level. Sugar feeding costs, labour costs and total capital costs were not significant at all levels of significance. The Adjusted R Squared results show that the explanatory variables jointly accounted for about 94 per cent of the total variation in value of production of these honey producers.

Those who provided pollination services primarily had lower costs and made slightly more money than those who produced only honey. Based on the results, pollinators surveyed in the northeast, northwest and peace region managed more hives compared with those in the south and central region. In addition, they had lower investment costs and made more money compared with those in the south and central region.

In total, 20 beekeepers reported revenues from selling bees (queens, nucs and hives); however, based on the proportion of bee sales to total value of production, only five beekeepers were selected to benchmark the costs and returns for the bee sales enterprise. The report shows that because of the low average honey yield per hive, all the estimated net returns or management indicators were negative for this group of beekeepers.

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 for producers.

SECTION I

Introduction

Costs and returns studies for livestock, crops and several other enterprises including beekeeping in Alberta have been monitored by the Economics Section of Alberta Agriculture and Irrigation (AGI) through the AgriProfit\$ program in an extensive way since the 1960s. These studies have been viewed as an important tool for assisting producers in their farming 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. This report which provides detailed information on the economics of beekeeping in Alberta during the 2022 production year and the previous one completed in 2016 shows that a third enterprise – bee sales which involves selling bees (queens, nucs and hives) in addition to honey production has emerged.

This report contains historical data and trends on the number of beekeepers, number of colonies, colonies per beekeeper, honey production, prices and farm cash receipts in Alberta and Canada from 2003 to 2022. Additionally, it provides information on honey bee imports, specifically, queens, packages and nucs. Furthermore, the 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 information of all production costs (variable and capital costs) as well as the net returns (management indicators).

The information presented in the report can assist individual study participants to compare their costs and returns with the group averages to better develop/manage their beekeeping operations. It can also be used for several purposes including preparation of feasibility studies, program evaluation and policy development for the beekeeping industry in Alberta.

Objectives of the study

The 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 establish how variation in size of operation affects the efficiency of resource use.
7. To provide an up-to-date economic report on beekeeping in Alberta to assist governments in developing programs and policies for this industry.

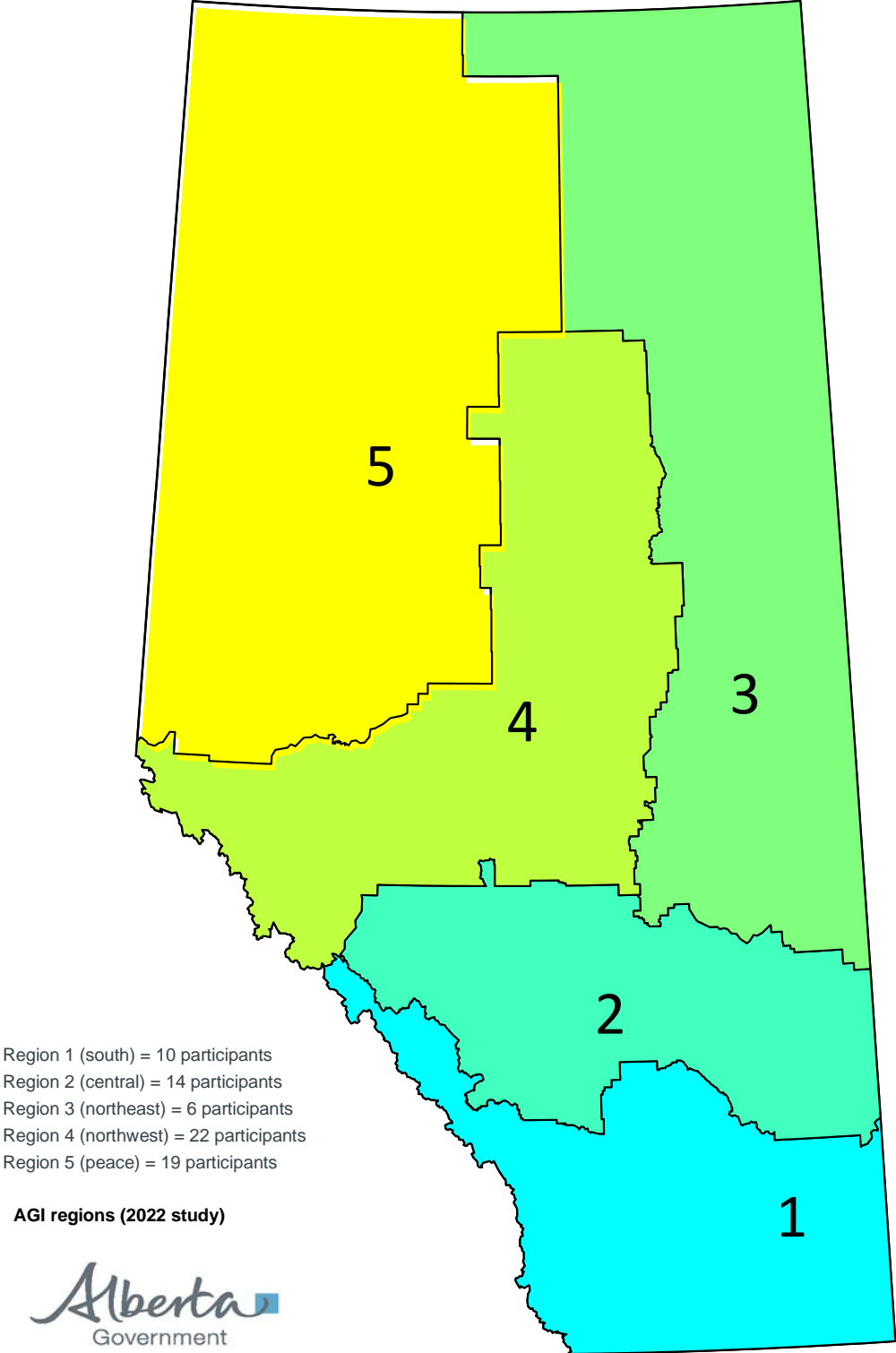
The study sample

The sample for the 2022 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 emailed to all the selected beekeepers after which individual phone calls were made by the interviewer to confirm their willingness to participate in the study.

In total, 71 beekeepers across the province agreed to be surveyed personally to obtain their detailed costs and returns information for the 2022 production season. These 71 beekeepers managed a total of 112,423 colonies, representing 37 per cent of Alberta's total number of colonies in 2022.

Figure 1 shows the distribution of the 71 beekeepers by region. The northwest (region 4) had the highest number of participants (22 participants). This was followed by peace (region 5) with 19 participants, central (region 2) with 14 participants, south (region 1) with 10 participants and the least were from northeast (region 3) with six participants.

FIGURE 1: DISTRIBUTION OF STUDY PARTICIPANTS BY REGION



The 71 beekeepers (study sample) which has been classified by region was further broken down according to the number of colonies and total pounds of honey produced. Table 1 highlights this breakdown by region, number of colonies and total pounds of honey produced.

TABLE 1: BREAKDOWN OF STUDY PARTICIPANTS BY REGION, NUMBER OF COLONIES AND TOTAL HONEY PRODUCED

Region	No. of participants	NUMBER OF COLONIES			Total	Honey production (lbs.)
		Average	Minimum	Maximum		
South	10	2,793	5	14,000	27,928	1,671,918
Central	14	937	27	4,700	13,120	1,340,406
Northeast	6	2,167	6	11,500	13,004	972,360
Northwest	22	1,143	6	4,033	25,136	3,816,235
Peace	19	1,749	18	8,000	33,235	2,776,983
TOTAL	71	1,583	5	14,000	112,423	10,583,353

As shown in table 1, the largest beekeeper in the study sample operated 14,000 hives and the smallest beekeeper managed five hives. In total, the study participants produced 10.58 million pounds of honey which represents approximately 35 per cent of Alberta's honey production in 2022.

The study sample was further classified according to the type of enterprise. 57 out of the 71 beekeepers produced only honey, nine (9) rented their hives for pollination and extracted honey and the remaining five (5) primarily produced honey and sold bees. Table 2 shows the breakdown of the study sample by type of enterprise.

TABLE 2: BREAKDOWN OF STUDY SAMPLE BY TYPE OF ENTERPRISE

Type of enterprise	No. of participants	NUMBER OF COLONIES			Total	Honey production (lbs.)
		Average	Minimum	Maximum		
Honey	57	1,076	5	7,050	61,350	7,648,985
Pollination	9	5,133	583	14,000	46,193	2,777,697
Bee sales	5	976	130	3,500	4,880	156,671
TOTAL	71	1,583	5	14,000	112,423	10,583,353

The study sample was further classified according to the size of operation. 48 out of the 71 beekeepers (68 per cent) operated up to 1000 hives and the remaining 23 beekeepers (32 per cent) operated more than 1,000 hives. Table 3 highlights this breakdown according to these size groupings.

TABLE 3: BREAKDOWN OF STUDY SAMPLE BY SIZE OF BEEKEEPING OPERATION

Type of enterprise	No. of participants	NUMBER OF COLONIES			Total	Honey production (lbs.)
		Average	Minimum	Maximum		
Up to 1,000 hives	48	303	5	1,000	14,530	1,669,732
400-1000 hives	17	667	450	1,000	11,335	1,284,025
100-399 hives	15	191	100	300	2,870	342,769
5-99 hives	16	20	5	50	325	42,938
Over 1,000 hives	23	4,256	1,100	14,000	97,893	8,913,621

The study sample was finally broken down by enterprise type into 10 groups based on region and size of operation. The first five groups relate to the regional classification while the last five focuses on the classification according to size of operation.

The main reason for this last classification is to summarize on one table the number of participants and the average number of hives they manage across these regional and size groupings. Table 4 shows the classification of the three-beekeeping enterprises by region and size of operation.

TABLE 4: CLASSIFICATION OF BEEKEEPING ENTERPRISE BY REGION AND SIZE OF OPERATION

	HONEY		POLLINATION		BEE SALES	
	No. of participants	Average no. of hives	No. of participants	Average no. of hives	No. of participants	Average no. of colonies
BY REGION						
Group I - South	6	1,261	3	6,553	1	700
Group II - Central	11	701	2	2,642	1	130
Group III - Northeast	5	301	1	11,500	N/A	N/A
Group IV - Northwest	20	1,229	N/A	N/A	2	275
Group V - Peace	15	1,332	3	3,250	1	3,500
Total	57	1,076	9	5,133	5	976
BY SIZE OF OPERATION						
Group VI - Up to 1,000 hives	42	284	2	617	4	345
Group VII - 400-1,000 hives	14	672	2	617	1	700
Group VIII -100-399 hives	12	183	N/A	N/A	2	190
Group IX - Less than 100 hives	16	20	N/A	N/A	N/A	N/A
Group X - More than 1,000 hives	15	3,296	7	6,423	1	3,500
Total	57	1,076	9	5,133	5	976

No. = Number

N/A = No data.

Method of analysis

The raw data obtained from the 71 beekeepers across the province was reviewed for information gaps before entering the data into the computer for analysis. Individual analyses, provincial and group averages (by region and size of operation) were developed using the Paradox program. Upon completion, 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) and

- hive rental - pollination.

The study participants were asked to provide actual sales and an estimate of expected price for any 2022 honey held in inventory and/or any other stock. Honey purchased for resale was excluded when estimating the total value of production.

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. 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

Overview of Alberta's beekeeping industry

Alberta is the largest honey producing province in Canada. Over the last several years, the beekeeping industry in Alberta has developed from being only honey production to providing pollination services and now a third enterprise has emerged: selling queens, bee nuclei and hives. Based on the 2022 study, more than 46,000 bee colonies were rented out during the summer of 2022 to pollinate pedigreed hybrid canola seed to ensure high yield of canola seed for farmers. Some of the beekeepers moved their bees to British Columbia to pollinate blueberries and cranberry. The data from the 2022 study shows that approximately 97 per cent of Alberta bee colonies are in commercial operations (operations with 400 or more hives).

In recent years, Alberta beekeepers have faced several challenges. This includes high over-winter losses, high varroa mite infestations and low honey yields due to drought. Due to the high winter losses of hives and drought in 2022, some beekeepers barely produced any honey despite their efforts to build colonies. Final estimates by Statistics Canada show that in 2022, Alberta beekeepers managed a total of 300,500 colonies, down 7.4 per cent compared to the 2021 total of 324,500 colonies. Despite these losses, Alberta accounted for 39 per cent of the total number of Canadian honey bee colonies in 2022 and produced more honey than any other province, accounting for nearly 41 per cent of Canada's 2022 total. Table 5 shows historical data on Alberta's beekeeping industry for the past 20 years (from 2003 to 2022).

TABLE 5: HISTORICAL DATA ON ALBERTA'S BEEKEEPING INDUSTRY, 2003 – 2022

Year	No. of beekeepers	No. of Colonies	Colonies per beekeeper	Average yield per colony (pounds)	Honey production (pounds x 1,000)	Price per (dollars per pound)	Honey farm cash receipts (dollars x 1,000)
2003	755	221,000	293	126	27,845	\$2.04	\$57,450
2004	695	248,000	357	135	33,480	\$1.51	\$53,075
2005	728	251,000	345	127	31,877	\$0.99	\$39,229
2006	733	254,000	347	184	46,736	\$0.99	\$40,247
2007	726	237,000	326	122	28,914	\$1.02	\$36,494
2008	620	226,000	365	115	25,990	\$1.45	\$34,423
2009	683	251,000	367	116	29,116	\$1.68	\$44,293
2010	769	266,000	346	130	34,580	\$1.63	\$53,199
2011	798	274,600	344	124	34,050	\$1.74	\$57,963
2012	883	278,400	315	136	38,000	\$1.80	\$64,579
2013	890	278,100	312	119	33,200	\$2.20	\$71,033
2014	1,015	282,900	279	125	35,500	\$2.25	\$76,966
2015	1,064	296,880	279	133	39,461	\$2.14	\$82,601
2016	1,453	309,000	213	130	40,170	\$1.55	\$71,476
2017	1,420	317,000	223	128	40,576	\$1.76	\$67,681
2018	1,572	311,000	198	124	38,564	\$1.72	\$68,476
2019	1,653	314,800	190	100	31,418	\$1.85	\$61,584
2020	1,621	283,000	175	109	30,735	\$2.17	\$63,296
2021	1,754	324,500	185	105	34,061	\$2.74	\$82,404
2022	1,700	300,500	177	101	30,407	\$3.11	\$94,095
2003-2022 Average	1,077	276,234	282	124	34,234	\$1.82	\$61,028
2022 / 2016 ¹	17%	-3%	-17%	-22%	-24%	101%	32%
% CAGR ²	2.3%	-0.4%	-2.6%	-3.5%	-3.9%	10.5%	4.0%

Source: Statistics Canada, Alberta Agriculture and Irrigation

¹ 2022 / 2016 Percentage Change

² 2016 to 2022 Compound Annual Growth Rate



In 2022, Alberta comprised 39 per cent of total Canadian honey bee colonies.

The percentage change between 2022 and 2016 as well as the compound annual growth rate which shows the year-over-year growth rate observed in the industry from 2016 to 2022 have been reported on the last two rows of table 5. These numbers have been calculated because the current and previous costs of production studies were completed with 2022 and 2016 data respectively.

Below are details on how number of beekeepers, number of honey bee colonies, honey production, average number of colonies per beekeeper, average yield per colony, honey prices and farm cash receipts in Alberta compares with that of Canada during the past 20 years. Also included in this overview are most recent statistics on Alberta imports of honey bees (queens, packages and bee nuclei or nucs).

Number of beekeepers



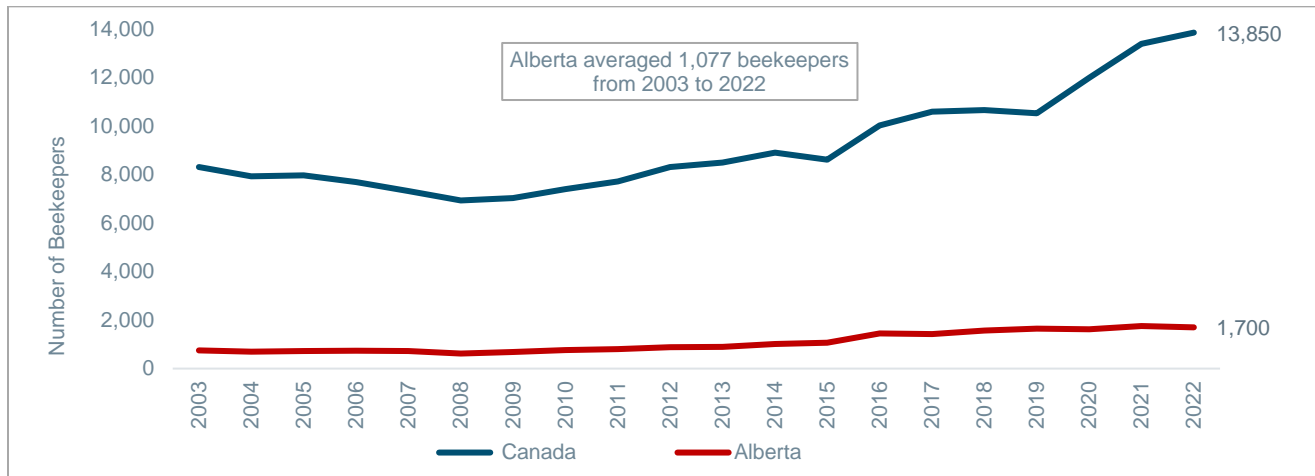
The number of Alberta beekeepers increased by 125 per cent from 2003 to 2022.

In 2022, Alberta totalled 1,700 beekeepers comprising 12 per cent of the total number of beekeepers in Canada. Compared to 2021, the number of Alberta beekeepers in 2022 decreased by approximately three per cent.

Over the past 20 years (from 2003 to 2022), the number of Alberta beekeepers have increased by 125 per cent. This translates on average to 1,077 beekeepers annually. Compared to 2016 when the previous cost of production study was completed, the number of beekeepers in 2022 have increased by 17 per cent. This translates to a compound annual growth rate of 2.3 per cent (table 5).

Figure 2 shows trends in the number of beekeepers in Alberta and Canada from 2003 to 2022.

FIGURE 2: NUMBER OF BEEKEEPERS IN ALBERTA AND CANADA, 2003-2022



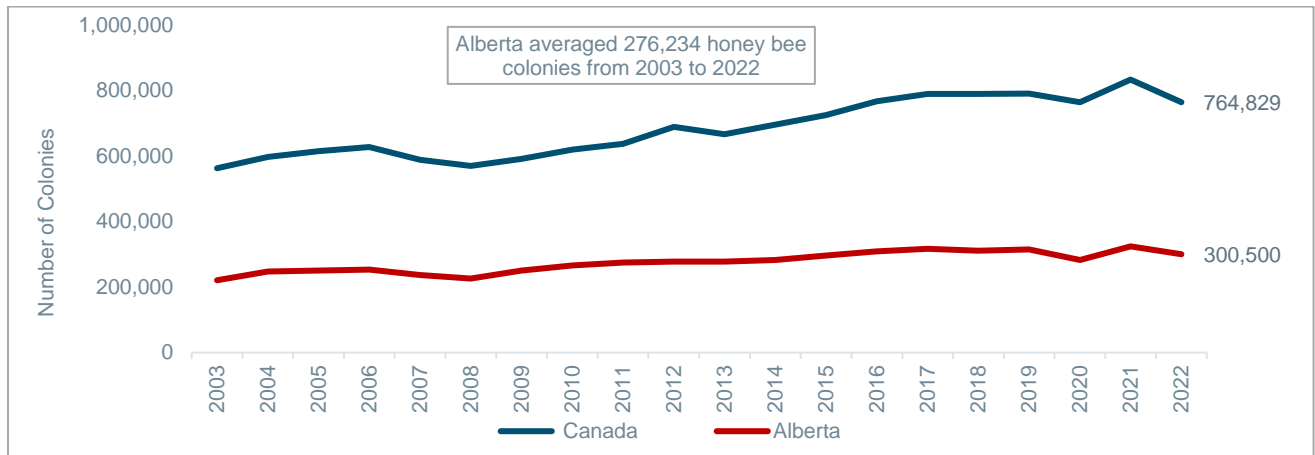
Source: Statistics Canada. Table 32-10-0353-01 Production and value of honey

Number of honey bee colonies

In 2022, Alberta had 300,500 honey bee colonies, down seven per cent from the 2021 total of 324,500 colonies. While Alberta accounts for a relatively small percentage of the nation's total beekeepers, it had about 39 per cent of honey bee colonies in 2022. From 2003 to 2022, Alberta averaged 276,234 colonies comprising 40 per cent of total Canadian bee colonies over the same period.

From 2016 to 2022, the number of colonies decreased by approximately three per cent. This translates to a compound annual growth rate of -0.4 per cent (table 5). Figure 3 shows trends in the number of honey bee colonies in Alberta and Canada from 2003 to 2022.

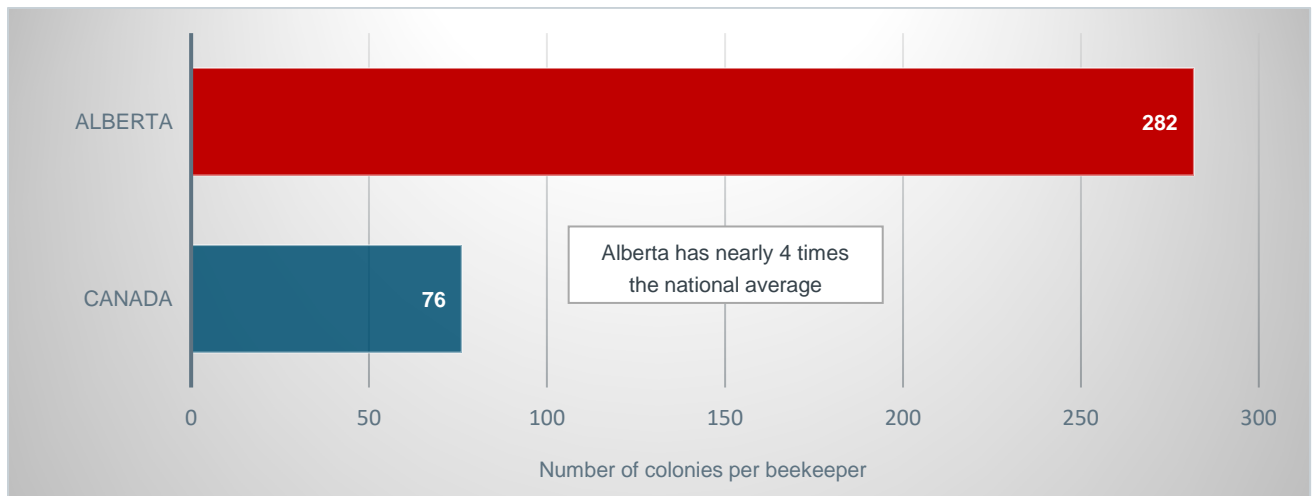
FIGURE 3: NUMBER OF HONEY BEE COLONIES IN ALBERTA AND CANADA, 2003-2022



Source: Statistics Canada. Table 32-10-0353-01 Production and value of honey

From 2003 to 2022, Alberta’s average number of colonies per beekeeper is nearly four times higher than the Canadian average. Figure 4 shows the average number of colonies per beekeeper in Alberta and Canada from 2003 to 2022.

FIGURE 4: AVERAGE NUMBER OF COLONIES PER BEEKEEPER IN ALBERTA AND CANADA, 2003-2022



Source: Statistics Canada. Table 32-10-0353-01 Production and value of honey

Honey production

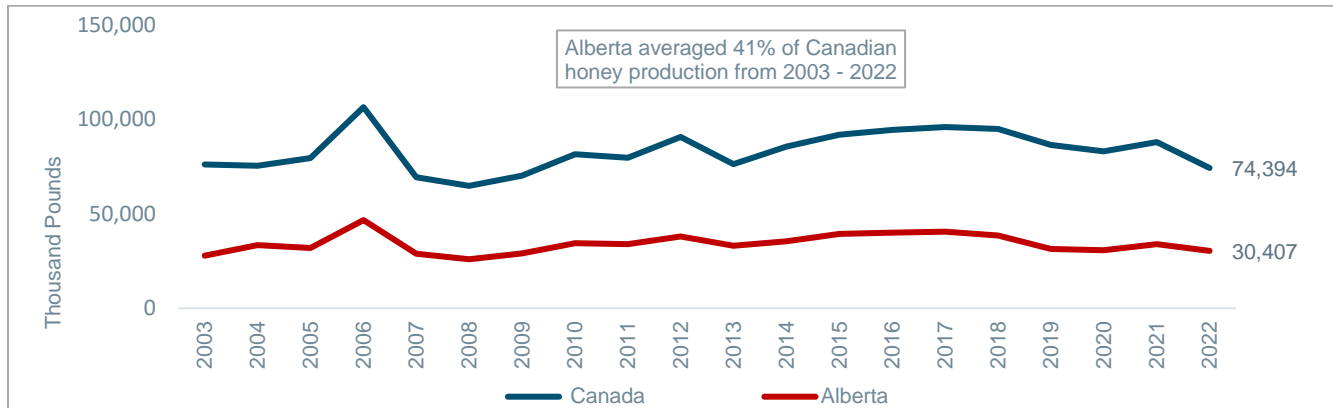


Alberta’s average honey production of 34.23 million pounds from 2003 to 2022 represents over 40 per cent of Canadian honey production.

Alberta is a significant producer of honey in Canada. In 2022, honey production in Alberta totaled 30.41 million pounds, down 11 per cent from the 2021 value of approximately 34.06 million pounds. Alberta’s honey production in 2022 accounted for about 41 per cent of honey production in Canada. During the past 20 years (2003 to 2022) Alberta honey production averaged 34.23 million pounds. This represents over 40 per cent of honey production in Canada.

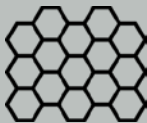
From 2016 to 2022, honey production decreased by 24 per cent. This translates to a compound annual growth rate of -3.9 per cent (table 5). Figure 5 shows trends in honey production in Alberta and Canada from 2003 to 2022.

FIGURE 5: HONEY PRODUCTION BY QUANTITY IN ALBERTA AND CANADA, 2003-2022



Source: Statistics Canada. Table 32-10-0353-01 Production and value of honey

Average yield per colony

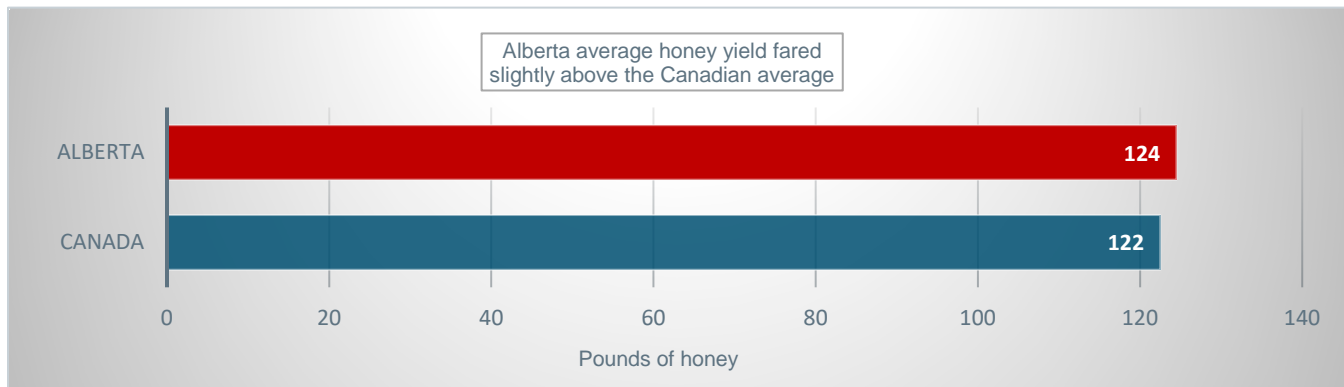


Alberta averaged 124 pounds per colony from 2003 to 2022.

Alberta averaged 124 pounds of honey per colony from 2003 to 2022, two pounds higher than Canada’s average. In 2022, average yield per colony in Alberta was 101 pounds, four pounds higher than Canada’s average of 97 pounds.

From 2016 to 2022, average honey yield per colony decreased by 22 per cent. This translates to a compound annual growth rate of -3.5 per cent (table 5). Figure 6 show the trends in average yield per colony over the period 2003 to 2022 in Alberta and Canada.

FIGURE 6: AVERAGE YIELD PER COLONY IN ALBERTA AND CANADA, 2003-2022



Source: Statistics Canada. Table 32-10-0353-01 Production and value of honey

Honey prices

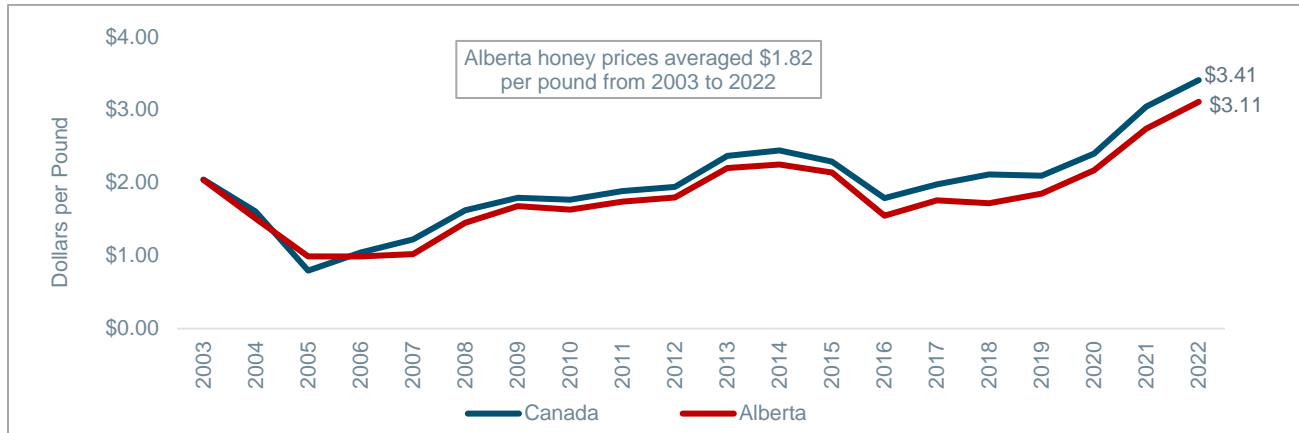


Alberta honey prices averaged \$1.82 per pound from 2003 to 2022.

Producer prices received per pound of honey in Alberta has varied annually during the past 20 years. In 2022, the average price of honey was \$3.11 per pound, up 14 per cent from the average price of \$2.74 per pound in 2021.

Alberta honey prices averaged \$1.82 per pound from 2003 to 2022. Over the period 2016 to 2022, the price per pound of honey in Alberta has increased by 101 per cent. This translates to a compound annual growth rate of 10.5 per cent (table 5). Figure 7 shows the trend in Alberta honey prices from 2003 to 2022.

FIGURE 7: HONEY PRICES IN ALBERTA - DOLLARS PER POUND, 2003 - 2022

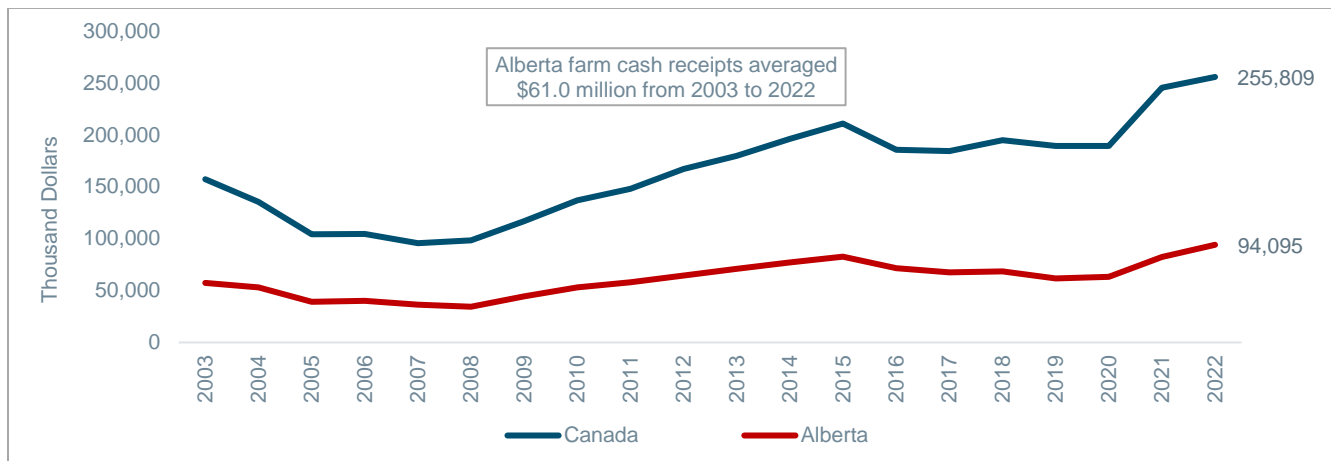


Source: Statistics Canada. Table 32-10-0353-01 Production and value of honey

Honey farm cash receipts

As illustrated in figure 8, Alberta farm cash receipts derived from honey production in 2022 totaled \$94.1 million, up 14 per cent from the 2021 value of \$82.4 million. Alberta’s honey market receipts averaged \$61.0 million from 2003 to 2022.

FIGURE 8: HONEY FARM CASH RECEIPTS IN ALBERTA, 2003 - 2022



Source: Statistics Canada. Table 32-10-0045-01 Farm cash receipts

Honey bee imports



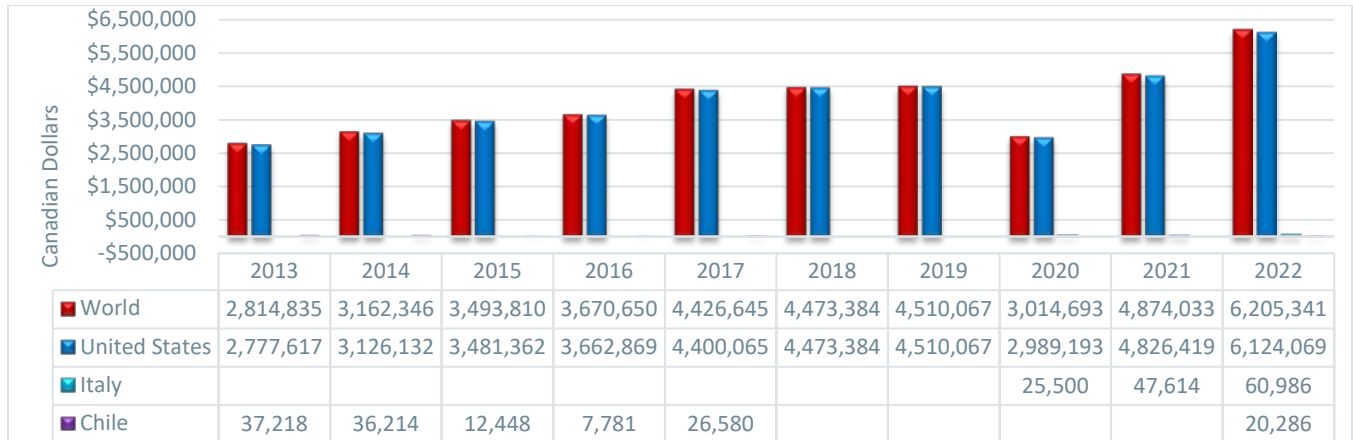
Alberta is reliant upon imports of live honey bees (queens and packages).

Importing live honey bees is critical for the sustainability of Alberta’s beekeeping industry. Alberta beekeepers import queen bees and bulk package bees each spring to replace over-winter queen and hive losses and to grow their operations. Generally, bulk bee packages consisting of bulk worker bees and a queen (imported without comb) are used by hobbyist beekeepers. Most commercial beekeepers are able to recover from ‘normal’ over-wintering losses by making splits (splitting a colony up to make new ones). Packages may be used to expand operations quickly or if over-wintering losses are severe. The bees are imported from countries and regions which have been evaluated to ensure that the bees imported do not pose any unacceptable risk to the beekeeping industry in Canada.

Queen bees

In 2022, Alberta accounted for about 49 per cent of total Canadian live queen bee imports. About 99 per cent of all Alberta imports of live queen bees originates from the United States (California and Hawaii). The remainder are from Italy and Chile. Figure 9 highlights the trend in Alberta queen bee imports by value during the past 10 years.

FIGURE 9: ALBERTA IMPORTS OF LIVE QUEEN BEES BY VALUE (2013 – 2022)

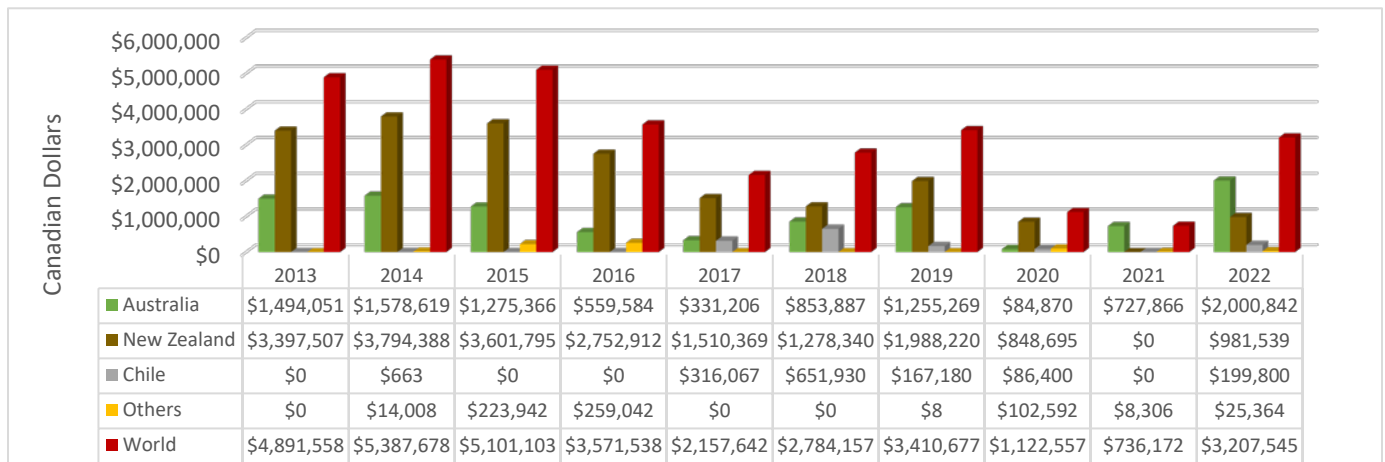


Source: Statistics Canada

Packages

Almost 100 per cent of bee packages used to replace over-winter losses and grow beekeeping operations are imported into Canada. Figure 10 highlights the trend in Canada's package honey bee imports by value during the past 10 years.

FIGURE 10: CANADA IMPORTS OF PACKAGE HONEY BEES BY VALUE (2013 – 2022)



Source: Statistics Canada

As shown in Figure 10, 62 per cent (\$2,000,842) of the total value of imported packages in 2022 arrived from Australia. This was followed by New Zealand with 31 per cent (\$981,539) and Chile with six per cent (\$199,800).

Nuclei (nucs)

The Survey of Alberta Beekeepers in 2022 shows that about 40.4 per cent of nucs purchases were from Alberta, 59 per cent from British Columbia and the remaining 0.6 per cent were from other Canadian provinces. The average nuc price in Alberta was \$255.10, while in British Columbia it was \$301.66 and from Saskatchewan it was \$291.43.

SECTION III

Honey production costs and returns in Alberta, 2022

The results in table 6 are based on data provided by 57 honey producers across the province. In 2022, honey produced for sale on average by each study participant was 134,193 pounds, of which 128,352 pounds (96 per cent) were sold as bulk honey. Bulk honey inventory was estimated at 2,562 pounds (two per cent); consumer pack sales at 1,693 pounds (one per cent) and other honey sales at 1,316 pounds (one per cent).

The average number of hives each study participant within this group of 57 beekeepers managed was 1,076 hives. The average yield per hive was estimated at 125 pounds. The average honey production per hive for this group of beekeepers was higher by 24 pounds compared to the provincial average of 101 pounds shown in table 5. Readers of this report are to note that production per hive is difficult to compare. 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 6.

Value of production:

The total value of honey produced (bulk honey sales, inventory, consumer pack sales, consumer pack inventory, other honey sales) per study participant amounted to \$409,164 in 2022. This translates to an average value per hive of \$380 or \$3.05 per pound of honey produced. The average value of \$3.05 per pound of honey produced by this group of 57 beekeepers is slightly lower than the provincial average price of \$3.11 per pound presented in table 5.

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 \$444,324 or \$413 per hive (\$3.31 per pound of honey produced).

Please note the average hive rental value shown on table 6 is from only one honey producer who rented out 320 of his hives for canola pollination at a fee of \$290.

Variable costs:

Variable costs (B) were estimated at \$288,023 per average study participant in 2022. In terms of variable costs per hive, the average amount was \$268 per hive (\$2.15 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 bee purchases, sugar for feeding, fuel, medicine/bee repellent and machine and building repairs.

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 \$118,958 or \$111 per hive or \$0.89 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 \$279,869 per average beekeeper in the study who was primarily focused on honey production. In terms of average cash costs per hive, the amount was \$260 or \$2.09 per pound of honey produced.

Total production costs:

Details on total production cost for an average study participant are presented in table 6. Average total production cost (E) was estimated at \$406,981 for an average honey operation with 1,076 hives. Average production cost was estimated at \$378 per hive or \$3.03 per pound of honey produced.

TABLE 6: HONEY PRODUCTION COSTS AND RETURNS, ALBERTA, 2022

		Total \$	\$/Hive	\$/Lb.	
(A)					
1.	Bulk honey sales	128,352.21 lbs.	388,869.00	361.30	3.03
2.	Bulk honey inventory	2,561.86 lbs.	8,401.68	7.81	
3.	Consumer pack sales	1,693.39 lbs.	6,904.54	6.41	
4.	Consumer pack inventory	269.47 lbs.	844.30	0.78	
5.	Other honey sales	1,315.79 lbs.	4,144.74	3.85	
6.	Wax/pollen/other sales	1,859.65 lbs.	10,013.55	9.30	
7.	Bee sales		4,270.18	3.97	
8.	Bee/honey insurance receipts		3,169.75	2.95	
9.	Miscellaneous receipts		16,432.58	15.27	
10.	Less: Honey purchase for resale		354.39	0.33	
11.	Hive rental – Pollination	6 hives	1,628.07	290.00	
VALUE OF PRODUCTION			444,324.01	412.82	3.31
(B)					
1.	Bee purchases - Package bees		9,977.00	9.27	
2.	Bee purchases - Queens		25,181.05	23.40	
3.	Bee purchases - Nucs		15,392.11	14.30	
4.	Freight and trucking		5,331.90	4.95	
5.	Sugar for feeding		33,909.58	31.51	
6.	Pollen supplement feeding		7,319.11	6.80	
7.	Medicine/bee repellent		10,105.55	9.39	
8.	Bee/honey Insurance		7,643.07	7.10	
9.	Fuel		12,382.53	11.50	
10.	Repairs - Machine		5,238.75	4.87	
11.	Repairs - Buildings and improvements		4,262.02	3.96	
12.	Utilities and heating fuel		9,369.34	8.71	
13.	Custom work and machine rental		3,246.16	3.02	
14.	Association dues, professional fees, promotion and travel		8,866.63	8.24	
15.	Small tools, supplies and miscellaneous expenses		9,473.28	8.80	
16.	Operating interest paid		1,667.56	1.55	
17.	Paid labour and benefits	4,725.27 hours	85,896.61	79.81	
18.	Unpaid labour	1,561.94 hours	32,760.75	30.44	
VARIABLE COSTS			288,022.98	267.60	2.15
(C)					
1.	Land Rent / Lease, building rent and forage access		4,692.32	4.36	
2.	Taxes, licences and general insurance		16,845.78	15.65	
3.	Equipment and buildings	A) depreciation	94,350.55	87.66	
		B) Lease payments	.00	.00	
4.	Paid capital interest		3,069.09	2.85	
TOTAL CAPITAL COSTS			118,957.73	110.52	.89
(D)	CASH COSTS	(B+C-B18-C3a)	279,869.41	260.03	2.09
(E)	TOTAL PRODUCTION COSTS	(B+C)	406,980.70	378.12	3.03
(F)	GROSS MARGIN	(A-D)	164,454.60	152.79	1.23
	RETURN TO UNPAID LABOUR	(A-E+B18)	70,104.05	65.13	.52
	RETURN TO INVESTMENT	(A-E+C4)	40,412.39	37.55	.30
	RETURN TO EQUITY	(A-E)	37,343.30	34.70	.28

MANAGEMENT

Number of hives	1,076.32
Average yield per hive (lbs.)	124.68
Honey produced (lbs.)	134,192.72

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 \$164,455 per beekeeping operation. Gross margin per hive was \$153 or \$1.23 per pound of honey produced. Average return to unpaid labour in 2022 was positive at \$70,104 per study participant. In terms of return to unpaid labour per hive, it amounted to \$65 or \$0.52 per pound of honey produced. Average return to investment was estimated at \$40,412 per operation or \$38 per hive (\$0.30 per pound of honey produced). Return to equity per hive was \$37,343 per average beekeeper or \$35 per hive (\$0.28 per pound of honey produced).

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 vehicle 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 7.

Land associated with the beekeeping operation was valued at \$167,237 or \$155 per hive. Building investment per study participant was estimated at \$610,112 or \$567 per hive. Bee equipment investment was \$454,109 per average operation or \$422 per hive. Machinery (automotive) investment was based on the percentage use of vehicles for the honey operation. This investment was estimated at \$165,033 or \$153 per hive. When all the investment items were added together, total investment amounted to \$1,396,491 per operation or \$1,297 per hive.

TABLE 7: HONEY PRODUCTION ENTERPRISE INVESTMENT, ALBERTA, 2022

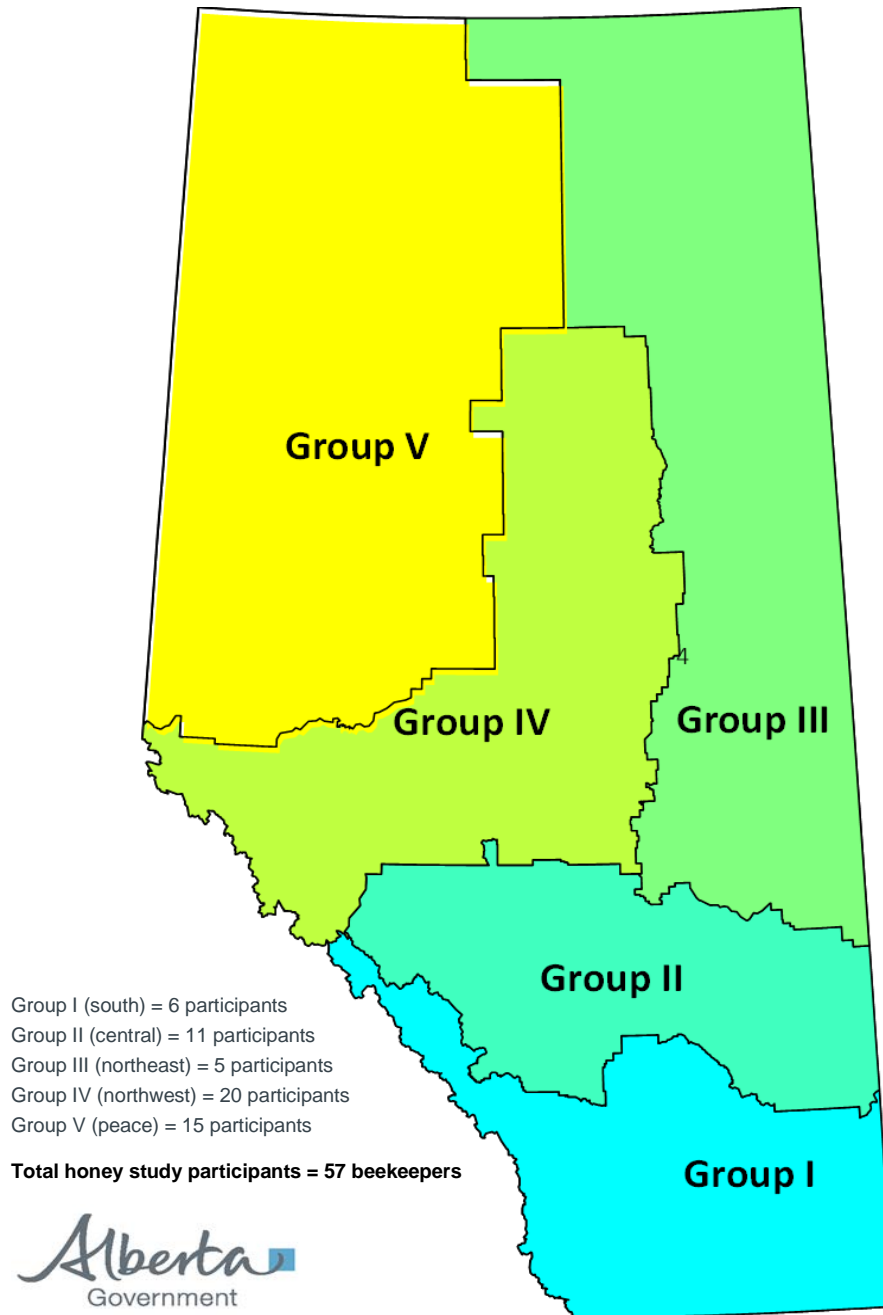
INVESTMENT SUMMARY:	Total \$		\$/Hive
Land	167,236.99		155.38
Buildings	610,112.48		566.85
Bee equipment	454,108.50		421.91
Machinery	165,032.63		153.33
TOTAL INVESTMENT	1,396,490.60		1,297.47
INVESTMENT DETAIL:	Enterprise value (\$)	Age (years)	Depreciation (\$)
Land	167,236.99		
Honey house	208,272.57	17.93	10,413.63
Wintering shed	228,929.82	8.88	11,446.49
Houses (25%)	74,848.68	23.67	3,742.43
Other buildings	98,061.40	16.11	4,903.07
Buildings subtotal	610,112.48		30,505.62
Hives	286,907.77	9.81	32,994.39
Pallets	9,487.81	6.58	1,091.10
Forklift	32,123.86	9.45	2,569.91
Hive feeders	15,796.14	6.23	1,816.56
Super elevator	.00	.00	.00
Uncapping machines	10,092.33	9.02	807.39
Honey extractor	21,386.84	11.37	1,710.95
Dryer/heat exchanger	5,229.82	5.16	418.39
Wax spinner/separator	8,991.23	6.40	719.30
Honey tank and pipe	11,404.34	10.25	1,311.50
Feed tank	4,751.93	6.79	546.47
Storage vessel	.00	.00	.00
Boiler furnace	5,837.48	4.81	467.00
Water system	.00	.00	.00
Compressor	931.07	8.00	74.49
Pressure washer	2,098.68	4.88	167.89
Fuel tank	.00	.00	.00
Scales	1,661.77	6.86	191.10
Barrels	7,354.07	2.56	845.72
Barrel loader	.00	.00	.00
Carts	558.25	8.33	64.20
Fencers / shockers	944.74	1.07	108.64
Shop tools	6,048.42	7.05	695.57
Staplers	628.77	4.84	72.31
Office equipment	.00	.00	.00
Lawn mower	3,268.33	6.09	261.47
Over-wintering insulation	18,604.85	6.33	2,139.56
Miscellaneous equipment	.00	.00	.00
Equipment subtotal	454,108.50		49,073.89
Trucks	114,689.39	11.65	5.61
Tractors	70.18	.32	5,610.41
Other Machinery	50,273.07	7.29	14,791.17
TOTAL INVESTMENT	1,396,490.60		94,370.69

SECTION IV

Honey production costs and returns by region, 2022

As presented on tables 2 and 4, 57 out of the total study sample of 71 beekeepers were first classified by enterprise type as honey producers and subsequently by region into five main groups. Group I (south) includes six beekeepers. Group II (central) includes 11 beekeepers, Group III (northeast) includes five beekeepers, Group IV (northwest) includes 20 beekeepers and Group V (peace) includes 15 beekeepers. Figure 11 shows the distribution of these 57 honey producers by region.

FIGURE 11: DISTRIBUTION OF HONEY STUDY PARTICIPANTS BY REGION



Group I (honey production costs and returns, southern region):

The results for Group I are based on data provided by six (6) honey producers from the southern region of Alberta.

On average, study participants in this group operated approximately 1,261 hives. The yield per hive for this group of beekeepers was estimated at 97 pounds, 28 pounds lower when compared with the yield of all 57 honey participants and only four pounds lower when compared with the provincial average of 101 pounds shown in table 5. Average honey production for this group was 122,390 pounds. The average costs and returns as well as investment results for Group I are presented in tables 8 and 9 respectively.

Total value of production:

As shown in table 8, total value of production including wax/pollen and miscellaneous receipts for this group amounted to \$370,749 per average beekeeper or \$294 per hive (\$3.03 per pound).

Variable costs:

Average variable costs per study participant in Group I was estimated at \$293,714 or \$233 per hive or \$2.40 per pound of honey produced.

Capital costs:

Average capital costs for group I participants amounted to \$142,065 per operation, or \$113 per hive (\$1.16 per pound of honey produced).

Cash costs:

Average cash costs (all out of pocket costs incurred during the honey production period) amounted to \$270,867 per each operation in Group I. This translates to \$215 per hive or \$2.21 per pound of honey produced.

Total production costs:

Average total production cost for study participants was estimated at \$435,778 per beekeeping operation. This translates to \$345 per hive or \$3.56 per pound of honey produced.

Management indicators:

Gross margin for study participants in Group I was estimated at \$99,882 per beekeeping operation with 1,261 hives. This translates to \$79 per hive or \$0.82 per pound of honey produced. As a result of the low total value of production, the remaining management indicators or net returns calculated were negative. Details on gross margin, returns to unpaid labour, investment and equity are presented in table 8, Section F.

Investment costs:

Average total investment for land, buildings, bee equipment and machinery for this group of honey producers is presented on table 9. Average total investment for honey producers in this group amounted to \$1,788,653 per operation or \$1,418 per hive.

TABLE 8: HONEY PRODUCTION COSTS AND RETURNS, SOUTHERN REGION, 2022

(A)		Total \$	\$/Hive	\$/Lb.	
1.	Bulk honey sales	119,385.00 lbs.	360,031.67	285.44	2.94
2.	Bulk honey inventory	84.33 lbs.	168.67	.13	
3.	Consumer pack sales	2,503.67 lbs.	9,011.00	7.14	
4.	Consumer pack inventory	416.67 lbs.	1,520.83	1.21	
5.	Other honey sales	0.00 lbs.	.00	.00	
6.	Wax/pollen/other sales	1.67 lbs.	16.67	.01	
7.	Bee sales		.00	.00	
8.	Bee/honey insurance receipts		.00	.00	
9.	Miscellaneous receipts		.00	.00	
10.	Less: Honey purchase for resale		.00	.00	
11.	Hive rental - Pollination		.00	.00	
VALUE OF PRODUCTION			370,748.83	293.93	3.03
(B)					
1.	Bee purchases - Package bees		33,743.67	26.75	
2.	Bee purchases - Queens		28,020.00	22.21	
3.	Bee purchases - Nucs		.00	.00	
4.	Freight and trucking		833.33	.66	
5.	Sugar for Feeding		44,716.67	35.45	
6.	Pollen supplement feeding		7,166.67	5.68	
7.	Medicine/bee repellent		2,171.67	1.72	
8.	Bee/honey insurance		.00	.00	
9.	Fuel		8,933.33	7.08	
10.	Repairs - Machine		3,500.00	2.77	
11.	Repairs - Buildings and improvements		5,208.33	4.13	
12.	Utilities and heating fuel		8,015.00	6.35	
13.	Custom work and machine rental		6,666.67	5.29	
14.	Association dues, professional fees, promotion and travel		2,110.00	1.67	
15.	Small tools, supplies and miscellaneous Expenses		2,791.67	2.21	
16.	Operating interest paid		.00	.00	
17.	Paid labour and benefits	5,200.00 hours	97,166.67	77.03	
18.	Unpaid labour	2,043.33 hours	42,670.00	33.83	
VARIABLE COSTS			293,713.67	232.86	2.40
(C)					
1.	Land rent / lease, building rent and forage access		8,440.00	6.69	
2.	Taxes, licences and general insurance		11,383.33	9.02	
3.	Equipment and buildings	a) Depreciation	122,241.36	96.91	
		b) Lease payments	.00	.00	
4.	Paid capital interest		.00	.00	
TOTAL CAPITAL COSTS			142,064.70	112.63	1.16
(D)	CASH COSTS	(B+C-B18-C3a)	270,867.00	214.75	2.21
(E)	TOTAL PRODUCTION COSTS	(B+C)	435,778.36	345.49	3.56
(F)	GROSS MARGIN	(A-D)	99,881.83	79.19	.82
	RETURN TO UNPAID LABOUR	(A-E+B18)	-22,359.53	-17.73	-.18
	RETURN TO INVESTMENT	(A-E+C4)	-65,029.53	-51.56	-.53
	RETURN TO EQUITY	(A-E)	-65,029.53	-51.56	-.53
MANAGEMENT					
	Number of hives		1,261.33		
	Average yield per hive (lbs.)		97.03		
	Honey produced (lbs.)		122,389.67		

TABLE 9: HONEY PRODUCTION ENTERPRISE INVESTMENT, SOUTHERN REGION, 2022

INVESTMENT SUMMARY:	Total \$		\$/Hive
Land	400,668.33		317.65
Buildings	505,208.33		400.54
Bee equipment	799,198.33		633.61
Machinery	83,577.50		66.26
TOTAL INVESTMENT	1,788,652.50		1,418.06
INVESTMENT DETAIL:	Enterprise value (\$)	Age (years)	Depreciation (\$)
Land	400,668.33		
Honey house	2,000.00	23.33	100.00
Wintering shed	334,166.67	9.17	16,708.33
Houses (25%)	76,458.33	22.00	3,822.92
Other buildings	92,583.33	5.11	4,629.17
Buildings Subtotal	505,208.33		25,260.42
Hives	678,970.00	13.00	78,081.55
Pallets	3,563.33	3.83	409.78
Forklift	6,666.67	8.33	533.33
Hive feeders	26,306.67	10.17	3,025.27
Super elevator	.00	.00	.00
Uncapping machines	9,110.00	6.33	728.80
Honey extractor	13,783.33	8.17	1,102.67
Dryer/heat exchanger	4,166.67	5.33	333.33
Wax spinner/separator	10,833.33	6.17	866.67
Honey tank and pipe	5,043.33	8.50	579.98
Feed tank	885.00	6.33	101.77
Storage vessel	.00	.00	.00
Boiler furnace	5,083.33	4.00	406.67
Water system	.00	.00	.00
Compressor	833.33	1.67	66.67
Pressure washer	916.67	2.83	73.33
Fuel tank	.00	.00	.00
Scales	2,316.67	3.17	266.42
Barrels	3,343.33	1.67	384.48
Barrel loader	.00	.00	.00
Carts	83.33	.83	9.58
Fencers / shockers	.00	.00	.00
Shop tools	3,333.33	3.33	383.33
Staplers	346.67	2.00	39.87
Office equipment	.00	.00	.00
Lawn mower	1,096.67	9.17	87.73
Over-wintering insulation	22,516.67	4.83	2,589.42
Miscellaneous equipment	.00	.00	.00
Equipment subtotal	799,198.33		90,070.66
Trucks	77,175.00	6.11	.00
Tractors	.00	.00	736.29
Other Machinery	6,402.50	10.95	6,910.29
TOTAL INVESTMENT	1,788,652.50		122,241.36

Group II (Honey production costs and returns, central region):

The results for Group II are based on data provided by 11 study participants from the central region of Alberta.

On average, study participants in this group operated approximately 701 hives. The average yield per hive for this group of beekeepers was estimated at 117 pounds, eight pounds lower when compared with the average yield of all 57 honey participants across the province. The average yield for Group II was 16 pounds higher than the provincial average of 101 pounds shown in table 5. Average honey production for this group was 81,967 pounds. The average costs and returns for Group II are presented in tables 10.

Total value of production:

As shown in table 10, total value of production including wax/pollen and miscellaneous receipts for this group amounted to \$282,908 per average beekeeper or \$404 per hive (\$3.45 per pound). Please note the average hive rental value shown on table 10 is from a honey producer who rented 320 of his hives for canola pollination.

Variable costs:

Average variable costs per study participant in Group I was estimated at \$208,846. This translates to approximately \$298 per hive or \$2.55 per pound of honey produced.

Capital costs:

Average capital costs for Group II participants amounted to \$82,321 per operation. This translates to approximately \$117 per hive or \$1.00 per pound of honey produced.

Cash costs:

Average cash costs (all out of pocket costs incurred during the honey production period) amounted to \$196,234 per each operation in Group II. This translates to \$280 per hive or \$2.39 per pound of honey produced.

Total production costs:

Average total production cost for study participants was estimated at \$291,167 per beekeeping operation. This translates to \$416 per hive or \$3.55 per pound of honey produced.

Management indicators:

Gross margin for study participants in Group II was estimated at \$86,674 per beekeeping operation with 701 hives. This translates to \$124 per hive or \$1.06 per pound of honey produced. Details on gross margin, returns to unpaid labour, investment and equity are presented in table 10, section F.

Investment costs:

Average total investment for land, buildings, bee equipment and machinery for this group of honey producers is presented on table 11. Average total investment per operation for honey producers in this group amounted to \$1,176,700. This translates to approximately \$1,679 per hive.

TABLE 10: HONEY PRODUCTION COSTS AND RETURNS, CENTRAL REGION, 2022

(A)		Total \$	\$/Hive	\$/Lb.	
1.	Bulk honey sales	76,630.91 lbs.	237,809.55	339.42	3.10
2.	Bulk honey inventory	472.73 lbs.	1,418.18	2.02	
3.	Consumer pack sales	3,772.73 lbs.	13,848.18	19.77	
4.	Consumer pack inventory	1,090.91 lbs.	3,272.73	4.67	
5.	Other honey sales	0.00 lbs.	.00	.00	
6.	Wax/pollen/other sales	617.45 lbs.	3,340.02	4.77	
7.	Bee sales		7,852.73	11.21	
8.	Bee/honey insurance receipts		6,919.18	9.88	
9.	Miscellaneous receipts		1,847.09	2.64	
10.	Less: Honey purchase for resale		1,836.36	2.62	
11.	Hive rental - Pollination	29 hives	8,436.36	290.00	
VALUE OF PRODUCTION			282,907.65	403.79	3.45
(B)					
1.	Bee purchases- Package bees		20,615.27	29.42	
2.	Bee purchases- Queens		12,212.45	17.43	
3.	Bee purchases- Nucs		22,781.82	32.52	
4.	Freight and trucking		3,002.91	4.29	
5.	Sugar for feeding		20,076.82	28.66	
6.	Pollen supplement feeding		3,439.27	4.91	
7.	Medicine/bee repellent		6,058.91	8.65	
8.	Bee/honey insurance		1,207.27	1.72	
9.	Fuel		10,224.91	14.59	
10.	Repairs - Machine		2,540.09	3.63	
11.	Repairs - Buildings and improvements		3,764.09	5.37	
12.	Utilities and heating fuel		7,906.18	11.28	
13.	Custom work and machine rental		134.91	.19	
14.	Association dues, professional fees, promotion and travel		6,927.36	9.89	
15.	Small tools, supplies and miscellaneous expenses		12,216.82	17.44	
16.	Operating interest paid		338.82	.48	
17.	Paid labour and benefits	2,356.52 hours	45,457.44	64.88	
18.	Unpaid labour	1,425.76 hours	29,940.90	42.73	
VARIABLE COSTS			208,846.25	298.08	2.55
(C)					
1.	Land rent / lease, building rent and forage access		2,720.00	3.88	
2.	Taxes, licences and general insurance		7,536.64	10.76	
3.	Equipment and buildings				
	a) Depreciation		64,992.56	92.76	
	b) Lease payments		.00	.00	
4.	Paid Capital Interest		7,071.82	10.09	
TOTAL CAPITAL COSTS			82,321.01	117.49	1.00
(D)	CASH COSTS	(B+C-B18-C3a)	196,233.80	280.08	2.39
(E)	TOTAL PRODUCTION COSTS	(B+C)	291,167.26	415.58	3.55
(F)	GROSS MARGIN	(A-D)	86,673.85	123.71	1.06
	RETURN TO UNPAID LABOUR	(A-E+B18)	21,681.29	30.95	.26
	RETURN TO INVESTMENT	(A-E+C4)	-1,187.79	-1.70	-0.01
	RETURN TO EQUITY	(A-E)	-8,259.61	-11.79	-1.00

MANAGEMENT

Number of hives	700.64
Average yield per hive (lbs.)	116.99
Honey produced (lbs.)	81,967.27

TABLE 11: HONEY PRODUCTION ENTERPRISE INVESTMENT, CENTRAL REGION, 2022

INVESTMENT SUMMARY:	Total \$		\$/Hive
Land	330,658.92		471.94
Buildings	421,688.64		601.87
Bee equipment	349,435.91		498.74
Machinery	74,916.91		106.93
TOTAL INVESTMENT	1,176,700.38		1,679.47
INVESTMENT DETAIL:	Enterprise value (\$)	Age (years)	Depreciation (\$)
Land	330,658.92		
Honey house	180,545.45	14.18	9,027.27
Wintering shed	134,681.82	3.73	6,734.09
Houses (25%)	63,988.64	26.73	3,199.43
Other buildings	42,472.73	17.06	2,123.64
Buildings subtotal	421,688.64		21,084.43
Hives	195,700.00	7.82	22,505.50
Pallets	7,261.82	5.91	835.11
Forklift	34,272.73	5.45	2,741.82
Hive feeders	23,785.45	5.09	2,735.33
Super elevator	.00	.00	.00
Uncapping machines	5,954.55	4.55	476.36
Honey extractor	19,100.00	10.18	1,528.00
Dryer/heat exchanger	3,272.73	3.73	261.82
Wax spinner/separator	4,000.00	3.36	320.00
Honey tank and pipe	3,969.09	11.09	456.45
Feed tank	2,681.82	5.55	308.41
Storage vessel	.00	.00	.00
Boiler furnace	6,954.55	3.55	556.36
Water system	.00	.00	.00
Compressor	777.27	5.64	62.18
Pressure washer	1,681.82	3.55	134.55
Fuel tank	.00	.00	.00
Scales	872.73	4.45	100.36
Barrels	15,840.91	5.55	1,821.70
Barrel loader	.00	.00	.00
Carts	450.00	4.45	51.75
Fencers / shockers	1,036.36	1.00	119.18
Shop tools	1,710.00	6.27	196.65
Staplers	363.18	6.18	41.77
Office equipment	.00	.00	.00
Lawn mower	1,263.64	6.09	101.09
Over-wintering insulation	18,487.27	6.64	2,126.04
Miscellaneous equipment	.00	.00	.00
Equipment subtotal	349,435.91		37,480.43
Trucks	60,816.00	10.05	.00
Tractors	.00	.00	1,562.42
Other machinery	14,100.91	6.43	6,427.70
TOTAL INVESTMENT	1,176,700.38		64,992.56

Group III (Honey production costs and returns, northeast region):

The average results for this group presented in tables 12 and 13 are based on data from five (5) study participants.

Average size of the beekeeping operation for Group III was 301 hives. The average yield per hive for this group of beekeepers was estimated at 115 pounds, 10 pounds lower when compared with the average yield of all 57 honey participants across the province. The average yield for Group III was 14 pounds higher than the provincial average of 101 pounds shown in table 5. Average honey production for this group was 34,472 pounds. The average costs and returns for Group III are presented in tables 12.

Total value of production:

As shown in table 12, total value of production including wax/pollen and miscellaneous receipts for this group amounted to \$119,936 per average beekeeper. This translates to approximately \$399 per hive or \$3.48 per pound of honey produced.

Variable costs:

Average variable costs per study participant in Group III was estimated at \$136,333. This translates to approximately \$453 per hive or \$3.95 per pound of honey produced.

Capital costs:

Average capital costs for Group III participants amounted to \$25,946 per operation. This translates to approximately \$86 per hive or \$0.75 per pound of honey produced.

Cash costs:

Average cash costs (all out of pocket costs incurred during the honey production period) amounted to \$110,940 per each operation in Group III. This translates to \$369 per hive or \$3.22 per pound of honey produced.

Total production costs:

Average total production cost for study participants was estimated at \$162,279 per beekeeping operation. This translates to \$539 per hive or \$4.71 per pound of honey produced.

Management indicators:

Gross margin for study participants in Group III was estimated at \$8,996 per beekeeping operation with 301 hives. This translates to \$30 per hive or \$0.26 per pound of honey produced. Details on gross margin, returns to unpaid labour, investment and equity are presented in Table 12, Section F.

Investment costs:

Average total investment for land, buildings, bee equipment and machinery for this group of honey producers is presented on table 13. Average total investment per operation for honey producers in this group amounted to \$359,610. This translates to approximately \$1,196 per hive.

TABLE 12: HONEY PRODUCTION COSTS AND RETURNS, NORTHEAST REGION, 2022

(A)			Total \$	\$/Hive	\$/Lb.
1.	Bulk honey sales	34,100.00 lbs.	104,772.00	348.31	3.07
2.	Bulk honey inventory	0.00 lbs.	.00	.00	
3.	Consumer pack sales	240.00 lbs.	984.00	3.27	
4.	Consumer pack inventory	132.00 lbs.	480.00	1.60	
5.	Other Honey Sales	0.00 lbs.	.00	.00	
6.	Wax/Pollen/Other Sales	20.00 lbs.	100.00	.33	
7.	Bee Sales		.00	.00	
8.	Bee/Honey Insurance receipts		.00	.00	
9.	Miscellaneous receipts		13,600.00	45.21	
10.	Less: Honey Purchase for resale		.00	.00	
11.	Hive Rental - Pollination		.00	.00	
VALUE OF PRODUCTION			119,936.00	398.72	3.48
(B)					
1.	Bee purchases- Package bees		.00	.00	
2.	Bee purchases- Queens		4,890.00	16.26	
3.	Bee purchases- Nucs		8,620.00	28.66	
4.	Freight and trucking		280.00	.93	
5.	Sugar for Feeding		8,420.00	27.99	
6.	Pollen supplement feeding		1,750.00	5.82	
7.	Medicine/bee repellent		2,903.00	9.65	
8.	Bee/honey insurance		1,000.00	3.32	
9.	Fuel		3,980.00	13.23	
10.	Repairs - machine		700.00	2.33	
11.	Repairs - Buildings and improvements		100.00	.33	
12.	Utilities and heating fuel		4,004.00	13.31	
13.	Custom work and machine rental		12,000.00	39.89	
14.	Association dues, professional fees, promotion and travel		1,155.00	3.84	
15.	Small tools, supplies and miscellaneous expenses		2,230.00	7.41	
16.	Operating interest paid		400.00	1.33	
17.	Paid labour and benefits	3,072.00 hours	55,296.00	183.83	
18.	Unpaid labour	1,370.15 hours	28,605.15	95.10	
VARIABLE COSTS			136,333.15	453.24	3.95
(C)					
1.	Land rent / lease, building rent and forage access		482.20	1.60	
2.	Taxes, licences and general insurance		2,590.00	8.61	
3.	Equipment and buildings	a) Depreciation	22,733.50	75.58	
		b) Lease Payments	.00	.00	
4.	Paid Capital Interest		140.00	.47	
TOTAL CAPITAL COSTS			25,945.70	86.26	.75
(D)	CASH COSTS	(B+C-B18-C3a)	110,940.20	368.82	3.22
(E)	TOTAL PRODUCTION COSTS	(B+C)	162,278.85	539.49	4.71
(F)	GROSS MARGIN	(A-D)	8,995.80	29.91	.26
	RETURN TO UNPAID LABOUR	(A-E+B18)	-13,737.70	-45.67	-.40
	RETURN TO INVESTMENT	(A-E+C4)	-42,202.85	-140.30	-1.22
	RETURN TO EQUITY	(A-E)	-42,342.85	-140.77	-1.23

MANAGEMENT

Number of hives	300.80
Average Yield per hive (lbs.)	114.60
Honey produced (lbs.)	34,472.00

TABLE 13: HONEY PRODUCTION ENTERPRISE INVESTMENT, NORTHEAST REGION, 2022

INVESTMENT SUMMARY:	Total \$		\$/Hive
Land	7,440.00		24.73
Buildings	213,250.00		708.94
Bee equipment	54,030.40		179.62
Machinery	84,889.20		282.21
TOTAL INVESTMENT	359,609.60		1,195.51

INVESTMENT DETAIL:	Enterprise value (\$)	Age (years)	Depreciation (\$)
Land	7,440.00		
Honey house	198,300.00	16.40	9,915.00
Wintering shed	.00	.00	.00
Houses (25%)	13,350.00	15.80	667.50
Other buildings	1,600.00	6.00	80.00
Buildings Subtotal	213,250.00		10,662.50
Hives	13,560.00	9.00	1,559.40
Pallets	822.00	5.60	94.53
Fork lift	2,072.00	8.40	165.76
Hive feeders	558.00	6.20	64.17
Super elevator	.00	.00	.00
Uncapping machines	1,800.00	7.00	144.00
Honey extractor	9,000.00	9.60	720.00
Dryer/heat exchanger	5,000.00	.40	400.00
Wax spinner/separator	2,600.00	6.00	208.00
Honey tank and pipe	480.00	7.00	55.20
Feed tank	1,240.00	7.00	142.60
Storage vessel	.00	.00	.00
Boiler furnace	4,000.00	.40	320.00
Water system	.00	.00	.00
Compressor	122.40	10.40	9.79
Pressure washer	650.00	1.40	52.00
Fuel tank	.00	.00	.00
Scales	20.00	5.00	2.30
Barrels	200.00	1.00	23.00
Barrel loader	.00	.00	.00
Carts	326.00	4.40	37.49
Fencers / shockers	440.00	2.20	50.60
Shop tools	1,060.00	2.60	121.90
Staplers	92.00	.60	10.58
Office equipment	.00	.00	.00
Lawn mower	5,220.00	3.00	417.60
Over-wintering insulation	4,768.00	1.20	548.32
Miscellaneous Equipment	.00	.00	.00
Equipment Subtotal	54,030.40		5,147.24
Trucks	71,800.00	6.85	.00
Tractors	.00	.00	1,179.76
Other Machinery	13,089.20	6.38	6,923.76
TOTAL INVESTMENT	359,609.60		22,733.50

Group IV (Honey production costs and returns, northwest region):

The average results for honey operations in the northwest region presented in tables 14 and 15 are based on data from 20 study participants.

The average size of a beekeeping operation in this Group was estimated at 1,229 hives. The average yield per hive for this group of beekeepers was estimated at 154 pounds, 29 pounds higher when compared with the average yield of all 57 honey participants across the province and 53 pounds higher than the provincial average of 101 pounds shown in table 5. Average honey production for this group was 189,312 pounds. The average costs and returns for Group IV are presented in table 14.

Total value of production:

As shown in table 14, total value of production including wax/pollen and miscellaneous receipts for this group amounted to \$642,308 per average beekeeper. This translates to approximately \$522 per hive or \$3.39 per pound of honey produced.

Variable costs:

Average variable costs per study participant in Group IV was estimated at \$332,415. This translates to approximately \$270 per hive or \$1.76 per pound of honey produced.

Capital costs:

Average capital costs for Group IV participants amounted to \$128,227 per operation. This translates to approximately \$104 per hive or \$0.68 per pound of honey produced.

Cash costs:

Average cash costs (all out of pocket costs incurred during the honey production period) amounted to \$333,977 per each operation in Group IV. This translates to \$272 per hive or \$1.76 per pound of honey produced.

Total production costs:

Average total production cost for study participants was estimated at \$460,641 per beekeeping operation. This translates to \$375 per hive or \$2.43 per pound of honey produced.

Management indicators:

Gross margin was estimated at \$308.331 per beekeeping operation in Group IV. This translates to \$251 per hive or \$1.63 per pound of honey produced. Return to unpaid labour for these study participants was \$214,629 on average or \$175 per hive or \$1.13 per pound of honey produced. Average return to investment was estimated at \$183,960 or approximately \$150 per hive and \$0.97 per pound of honey produced. Average return to equity was estimated at \$181,666 or approximately \$148 per hive and \$0.96 per pound of honey produced. Details on gross margin, returns to unpaid labour, investment and equity are presented in table 14, section F.

Investment costs:

Average total investment for land, buildings, bee equipment and machinery (vehicles) for study participants in the northwest region amounted to \$1,296,182 per operation or \$1,054 per hive. Details on land, buildings, bee equipment, machinery and vehicle investment costs for this group are presented in table 15.

TABLE 14: HONEY PRODUCTION COSTS AND RETURNS, NORTHWEST REGION, 2022

(A)		Total \$	\$/Hive	\$/Lb.	
1.	Bulk honey sales	188,388.19 lbs.	564,325.27	459.06	3.00
2.	Bulk honey inventory	186.00 lbs.	739.20	.60	
3.	Consumer pack sales	727.57 lbs.	3,059.65	2.49	
4.	Consumer pack inventory	10.00 lbs.	30.00	.02	
5.	Other honey sales	.00 lbs.	.00	.00	
6.	Wax/pollen/other sales	4,371.60 lbs.	22,805.96	18.55	
7.	Bee sales		6,765.00	5.50	
8.	Bee/honey insurance receipts		5,228.25	4.25	
9.	Miscellaneous receipts		39,354.45	32.01	
10.	Less: Honey purchase for resale		.00	.00	
11.	Hive rental - Pollination		.00	.00	
VALUE OF PRODUCTION			642,307.78	522.50	3.39
(B)					
1.	Bee purchases- Package bees		2,419.45	1.97	
2.	Bee purchases- Queens		33,515.34	27.26	
3.	Bee purchases- Nucs		9,040.00	7.35	
4.	Freight and trucking		8,693.83	7.07	
5.	Sugar for Feeding		43,904.79	35.72	
6.	Pollen Supplement feeding		14,889.95	12.11	
7.	Medicine/bee repellent		17,721.16	14.42	
8.	Bee/honey insurance		6,500.85	5.29	
9.	Fuel		13,911.50	11.32	
10.	Repairs - Machine		6,933.39	5.64	
11.	Repairs - Buildings and improvements		6,384.00	5.19	
12.	Utilities and heating fuel		8,482.84	6.90	
13.	Custom work and machine rental		3,110.55	2.53	
14.	Association dues, professional fees, promotion and travel		7,699.00	6.26	
15.	Small tools, supplies and miscellaneous expenses		12,156.75	9.89	
16.	Operating interest paid		1,826.49	1.49	
17.	Paid labour and benefits	5,828.85 hours	102,262.03	83.19	
18.	Unpaid labour	1,569.65 hours	32,962.60	26.81	
VARIABLE COSTS			332,414.51	270.41	1.76
(C)					
1.	Land rent / lease, building rent and forage access		6,396.40	5.20	
2.	Taxes, licences and general insurance		25,835.36	21.02	
3.	Equipment and buildings	a) Depreciation	93,701.58	76.22	
		b) Lease payments	.00	.00	
4.	Paid capital interest		2,293.45	1.87	
TOTAL CAPITAL COSTS			128,226.79	104.31	.68
(D)	CASH COSTS	(B+C-B18-C3a)	333,977.12	271.68	1.76
(E)	TOTAL PRODUCTION COSTS	(B+C)	460,641.30	374.72	2.43
(F)	GROSS MARGIN	(A-D)	308,330.65	250.82	1.63
	RETURN TO UNPAID LABOUR	(A-E+B18)	214,629.07	174.59	1.13
	RETURN TO INVESTMENT	(A-E+C4) 14.2%	183,959.92	149.65	.97
	RETURN TO EQUITY	(A-E)	181,666.47	147.78	.96
MANAGEMENT					
	Number of hives		1,229.30		
	Average yield per hive (lbs.)		154.00		
	Honey produced (lbs.)		189,311.76		

TABLE 15: HONEY PRODUCTION ENTERPRISE INVESTMENT, NORTHWEST REGION, 2022

INVESTMENT SUMMARY:	Total \$		\$/Hive
Land	72,757.50		59.19
Buildings	594,709.32		483.78
Bee equipment	407,634.88		331.60
Machinery	221,080.65		179.84
TOTAL INVESTMENT	1,296,182.35		1,054.41

INVESTMENT DETAIL:	Enterprise value (\$)	Age (years)	Depreciation (\$)
Land	72,757.50		
Honey house	213,601.82	19.35	10,680.09
Wintering shed	228,650.00	11.90	11,432.50
Houses (25%)	51,162.50	20.10	2,558.13
Other buildings	101,295.00	15.94	5,064.75
Buildings subtotal	594,709.32		29,735.47
Hives	226,166.14	10.05	26,009.11
Pallets	8,829.25	6.15	1,015.36
Forklift	25,510.00	10.30	2,040.80
Hive feeders	12,352.50	5.50	1,420.54
Super elevator	.00	.00	.00
Uncapping machines	10,730.14	13.20	858.41
Honey extractor	29,187.50	16.70	2,335.00
Dryer/heat exchanger	5,555.00	9.10	444.40
Wax spinner/separator	10,250.00	10.20	820.00
Honey tank and pipe	17,376.36	11.00	1,998.28
Feed tank	6,020.00	6.40	692.30
Storage vessel	.00	.00	.00
Boiler furnace	3,781.82	5.30	302.55
Water system	.00	.00	.00
Compressor	997.95	7.65	79.84
Pressure washer	3,236.25	5.10	258.90
Fuel tank	.00	.00	.00
Scales	2,288.55	6.20	263.18
Barrels	9,773.61	2.85	1,123.97
Barrel loader	.00	.00	.00
Carts	752.00	10.25	86.48
Fencers / shockers	1,200.00	1.45	138.00
Shop tools	9,362.50	7.45	1,076.69
Staplers	1,083.25	4.95	124.57
Office equipment	.00	.00	.00
Lawn mower	4,837.00	5.50	386.96
Over-wintering insulation	18,345.07	8.35	2,109.68
Miscellaneous equipment	.00	.00	.00
Equipment subtotal	407,634.88		43,585.01
Trucks	137,758.45	11.90	.00
Tractors	.00	.00	9,366.31
Other machinery	83,322.20	7.46	20,386.99
TOTAL INVESTMENT	1,296,182.35		93,707.47

Group V (Honey production costs and returns, peace region):

The average results for honey operations in the peace region presented in tables 16 and 17 are based on data from 15 study participants.

The average size of a beekeeping operation in this group was estimated at 1,332 hives. The average yield per hive was estimated at 103 pounds, 22 pounds lower when compared with the average yield of all 57 honey participants across the province and two pounds higher than the provincial average of 101 pounds shown in table 5. Average honey production for this group was 136,961 pounds. The average costs and returns for Group V are presented in tables 16.

Total value of production:

As shown in table 16, total value of production including wax/pollen and miscellaneous receipts for this group amounted to \$436,277 per average beekeeper. This translates to approximately \$327 per hive or \$3.19 per pound of honey produced.

Variable costs:

Average variable costs per study participant in Group V was estimated at \$335,184. This translates to approximately \$252 per hive or \$2.45 per pound of honey produced.

Capital costs:

Average capital costs for Group V participants amounted to \$155,227 per operation. This translates to approximately \$117 per hive or \$1.13 per pound of honey produced.

Cash costs:

Average cash costs (all out of pocket costs incurred during the honey production period) amounted to \$328.969 per each operation in Group V. This translates to \$247 per hive or \$2.40 per pound of honey produced.

Total Production costs:

Average total production cost for study participants was estimated at \$490,411 per beekeeping operation. This translates to \$368 per hive or \$3.58 per pound of honey produced.

Management indicators:

Except for gross margin which was estimated at \$107,308 per beekeeping operation (\$81 per hive or \$0.78 per pound of honey produced) all the other net returns were negative. Details on gross margin, returns to unpaid labour, investment and equity are presented in table 16, section F.

Investment costs:

Average total investment for land, buildings, bee equipment and machinery (vehicles) for study participants in the Peace region amounted to \$1,880,177 per operation or \$1,411 per hive. Details on land, buildings, bee equipment, machinery and vehicle investment costs for this group are presented in table 17.

TABLE 16: HONEY PRODUCTION COSTS AND RETURNS, PEACE REGION, 2022

		Total \$	\$/Hive	\$/Lb.
(A)				
1.	Bulk honey sales	121,237.47 lbs.	371,938.17	279.16
2.	Bulk honey inventory	9,106.67 lbs.	29,833.33	22.39
3.	Consumer pack sales	1,616.67 lbs.	8,070.00	6.06
4.	Consumer pack inventory	0.00 lbs.	.00	.00
5.	Other honey sales	5,000.00 lbs.	15,750.00	11.82
6.	Wax/pollen/other sales	777.73 lbs.	5,154.20	3.87
7.	Bee sales		1,448.00	1.09
8.	Bee/honey insurance receipts		.00	.00
9.	Miscellaneous receipts		4,083.33	3.06
10.	Less: Honey purchase for resale		.00	.00
11.	Hive rental - Pollination		.00	.00
VALUE OF PRODUCTION		436,277.04	327.45	3.19
(B)				
1.	Bee purchases - Package bees		6,071.33	4.56
2.	Bee purchases - Queens		29,207.07	21.92
3.	Bee purchases - Nucs		26,856.67	20.16
4.	Freight and trucking		6,040.67	4.53
5.	Sugar for feeding		34,900.33	26.19
6.	Pollen supplement feeding		1,987.20	1.49
7.	Medicine/bee repellent		8,493.33	6.37
8.	Bee/honey insurance		19,157.20	14.38
9.	Fuel		16,106.67	12.09
10.	Repairs - Machine		7,166.67	5.38
11.	Repairs - Buildings and improvements		2,806.67	2.11
12.	Utilities and heating fuel		13,954.52	10.47
13.	Custom Work and machine rental		1,422.40	1.07
14.	Association dues, professional fees, promotion and travel		17,118.80	12.85
15.	Small tools, supplies and miscellaneous expenses		8,970.47	6.73
16.	Operating interest paid		3,519.60	2.64
17.	Paid labour and benefits	5,352.11 hours	99,423.61	74.62
18.	Unpaid labour	1,522.90 hours	31,981.00	24.00
VARIABLE COSTS		335,184.20	251.58	2.45
(C)				
1.	Land rent / Lease, building rent and forage access		3,770.87	2.83
2.	Taxes, licences and general insurance		18,623.27	13.98
3.	Equipment and buildings	a) Depreciation	129,461.06	97.17
		b) Lease payments	.00	.00
4.	Paid capital interest		3,371.93	2.53
TOTAL CAPITAL COSTS		155,227.13	116.51	1.13
(D)	CASH COSTS	(B+C-B18-C3a)	328,969.27	246.91
(E)	TOTAL PRODUCTION COSTS	(B+C)	490,411.32	368.08
(F)	GROSS MARGIN	(A-D)	107,307.77	80.54
	RETURN TO UNPAID LABOUR	(A-E+B18)	-22,153.28	-16.63
	RETURN TO INVESTMENT	(A-E+C4)	-50,762.35	-38.10
	RETURN TO EQUITY	(A-E)	-54,134.28	-40.63
MANAGEMENT				
	Number of hives		1,332.33	
	Average yield per hive (lbs.)		102.80	
	Honey produced (lbs.)		136,960.80	

TABLE 17: HONEY PRODUCTION ENTERPRISE INVESTMENT, PEACE REGION, 2022

INVESTMENT SUMMARY:	Total \$	\$/Hive
Land	133,260.00	100.02
Buildings	943,076.67	707.84
Bee equipment	588,156.67	441.45
Machinery	215,683.33	161.88
TOTAL INVESTMENT	1,880,176.67	1,411.19

INVESTMENT DETAIL:	Enterprise value (\$)	Age (years)	Depreciation (\$)
Land	133,260.00		
Honey house	307,333.33	17.13	15,366.67
Wintering shed	332,633.33	11.47	16,631.67
Houses (25%)	134,250.00	29.47	6,712.50
Other buildings	168,860.00	23.42	8,443.00
Buildings subtotal	943,076.67		47,153.83
Hives	369,073.33	9.93	42,443.43
Pallets	17,256.67	9.07	1,984.52
Forklift	59,566.67	12.03	4,765.33
Hive feeders	15,404.00	6.47	1,771.46
Super elevator	.00	.00	.00
Uncapping machines	15,433.33	8.47	1,234.67
Honey extractor	19,833.33	7.00	1,586.67
Dryer/heat exchanger	6,733.33	2.47	538.67
Wax spinner/separator	12,366.67	3.80	989.33
Honey tank and pipe	15,080.00	10.40	1,734.20
Feed tank	7,296.67	8.33	839.12
Storage vessel	.00	.00	.00
Boiler furnace	8,673.33	6.87	693.87
Water system	.00	.00	.00
Compressor	1,263.33	11.93	101.07
Pressure washer	1,843.33	7.53	147.47
Fuel tank	.00	.00	.00
Scales	1,690.00	11.60	194.35
Barrels	1,893.33	.87	217.73
Barrel loader	.00	.00	.00
Carts	646.67	12.93	74.37
Fencers / shockers	1,083.33	.67	124.58
Shop tools	7,560.00	10.07	869.40
Staplers	509.33	6.27	58.57
Office equipment	.00	.00	.00
Lawn mower	2,865.00	6.67	229.20
Over-wintering insulation	22,085.00	5.73	2,539.78
Miscellaneous equipment	.00	.00	.00
Equipment subtotal	588,156.67		63,137.78
Trucks	152,740.00	16.32	21.33
Tractors	266.67	1.20	6,997.58
Other machinery	62,676.67	6.53	19,238.12
TOTAL INVESTMENT	1,880,176.67		129,529.73

SECTION V

Honey production costs and returns by size of operation, 2022

As presented below and on table 4, the study sample of 57 honey participants was analyzed based on size to determine whether size of operation had any effect on overall production costs and net returns of these honey producers.

Honey producer	Size of operation	No. of participants	Average No. of hives
Group VI	5 to 1,000 hives	42	284
Group VII	400 to 1,000 hives	14	672
Group VIII	100 to 399 hives	12	183
Group IX	Less than 100 hives	16	20
Group X	More than 1,000 hives	15	3,296
Total		57	1,076

Group VI (5 to 1,000 hives):

The average costs and returns for the 42 honey study participants who fall within Group VI are presented in table 18. The average yield per hive for this group of beekeepers was estimated at 127 pounds, two pounds higher when compared with the average yield of all 57 honey participants across the province and 26 pounds higher than the provincial average of 101 pounds shown in table 5. Average honey production for this group was 36,056 pounds.

Total value of production:

As shown in table 18, total value of production including wax/pollen and miscellaneous receipts for this group amounted to \$119,697 per average beekeeper. This translates to approximately \$422 per hive or \$3.32 per pound of honey produced.

Variable costs:

Average variable costs per study participant in Group VI were estimated to be \$83,577. This translates to approximately \$295 per hive or \$2.32 per pound of honey produced.

Capital costs:

Average capital costs for Group VI participants amounted to \$39,763 per operation. This translates to approximately \$140 per hive or \$1.10 per pound of honey produced.

Cash costs:

Average cash costs (all out of pocket costs incurred during the honey production period) amounted to \$68,368 per each Group VI operation. This translates to \$241 per hive or \$1.90 per pound of honey produced.

Total production costs:

Average total production cost for study participants was estimated at \$123,339 per beekeeping operation. This translates to \$435 per hive or \$3.42 per pound of honey produced.

Management indicators:

As presented in table 18, only gross margin and return to unpaid labour were positive. Average gross margin per beekeeping operation in Group VI was estimated at \$51,329 (\$181 per hive or \$1.42 per pound of honey produced) while return to unpaid labour was estimated at \$19,006 (\$67 per hive or \$0.53 per pound of honey produced).

Investment costs:

Average total investment for land, buildings, bee equipment and machinery (vehicles) for Group VI amounted to \$563,591 per operation or \$1,986 per hive. Details on land, buildings, bee equipment, machinery and vehicle investment costs for this group are presented in table 19.

TABLE 18: HONEY PRODUCTION COSTS AND RETURNS BY SIZE (5 TO 1,000 HIVES), 2022

(A)			Total \$	\$/Hive	\$/Lb.
1.	Bulk honey sales	34,129.40 lbs.	101,641.40	358.22	2.98
2.	Bulk honey inventory	476.81 lbs.	1,857.05	6.54	
3.	Consumer pack sales	1,369.61 lbs.	5,122.83	18.05	
4.	Consumer pack inventory	80.00 lbs.	288.69	1.02	
5.	Other honey sales	0.00 lbs.	.00	.00	
6.	Wax/pollen/other sales	383.36 lbs.	1,905.35	6.72	
7.	Bee Sales		4,698.10	16.56	
8.	Bee/honey insurance receipts		2,142.86	7.55	
9.	Miscellaneous receipts		2,040.48	7.19	
10.	Less: Honey purchase for resale		.00	.00	
11.	Hive rental - Pollination		.00	.00	
VALUE OF PRODUCTION			119,696.74	421.86	3.32
(B)					
1.	Bee purchases - Package bees		1,509.55	5.32	
2.	Bee purchases - Queens		5,046.54	17.79	
3.	Bee purchases - Nucs		2,922.62	10.30	
4.	Freight and trucking		776.92	2.74	
5.	Sugar for feeding		8,722.14	30.74	
6.	Pollen supplement feeding		920.36	3.24	
7.	Medicine/bee repellent		1,882.70	6.64	
8.	Bee/honey insurance		530.48	1.87	
9.	Fuel		4,324.88	15.24	
10.	Repairs - Machine		886.00	3.12	
11.	Repairs - Buildings and improvements		834.31	2.94	
12.	Utilities and heating fuel		3,811.49	13.43	
13.	Custom work and machine rental		2,790.48	9.83	
14.	Association dues, professional fees, promotion and travel		1,946.00	6.86	
15.	Small tools, supplies and miscellaneous expenses		2,681.62	9.45	
16.	Operating interest paid		768.02	2.71	
17.	Paid labour and benefits	1,157.01 hours	20,574.00	72.51	
18.	Unpaid labour	1,081.09 hours	22,648.51	79.82	
VARIABLE COSTS			83,576.60	294.56	2.32
(C)					
1.	Land rent / lease, building rent and forage access		997.55	3.52	
2.	Taxes, licences and general insurance		5,930.91	20.90	
3.	Equipment and buildings				
	a) Depreciation		32,322.74	113.92	
	b) Lease payments		.00	.00	
4.	Paid capital interest		511.48	1.80	
TOTAL CAPITAL COSTS			39,762.67	140.14	1.10
(D)	CASH COSTS	(B+C-B18-C3a)	68,368.02	240.95	1.90
(E)	TOTAL PRODUCTION COSTS	(B+C)	123,339.27	434.69	3.42
(F)	GROSS MARGIN	(A-D)	51,328.73	180.90	1.42
	RETURN TO UNPAID LABOUR	(A-E+B18)	19,005.99	66.98	.53
	RETURN TO INVESTMENT	(A-E+C4)	-3,131.05	-11.04	-.09
	RETURN TO EQUITY	(A-E)	-3,642.53	-12.84	-.10

MANAGEMENT

Number of hives	283.74
Average yield per hive (lbs.)	127.07
Honey produced (lbs.)	36,055.81

TABLE 19: HONEY PRODUCTION ENTERPRISE INVESTMENT BY SIZE (5 TO 1,000 HIVES), 2022

INVESTMENT SUMMARY:	Total \$		\$/Hive
Land	114,215.67		402.54
Buildings	254,875.27		898.28
Bee Equipment	133,649.16		471.03
Machinery	60,851.10		214.46
TOTAL INVESTMENT	563,591.19		1,986.31
INVESTMENT DETAIL:	Enterprise value (\$)	Age (years)	Depreciation (\$)
Land	114,215.67		
Honey house	141,979.44	17.43	7,098.97
Wintering shed	41,547.62	7.55	2,077.38
Houses (25%)	55,836.31	24.02	2,791.82
Other buildings	15,511.90	11.97	775.60
Buildings subtotal	254,875.27		12,743.76
Hives	81,017.68	9.48	9,317.03
Pallets	3,623.93	5.26	416.75
ForkLift	9,656.19	7.98	772.50
Hive feeders	3,766.19	5.62	433.11
Super elevator	.00	.00	.00
Uncapping machines	4,613.40	8.24	369.07
Honey extractor	8,227.38	11.02	658.19
Dryer/heat exchanger	1,714.29	3.93	137.14
Wax spinner/separator	2,154.76	5.19	172.38
Honey tank and pipe	2,691.60	8.31	309.53
Feed tank	1,615.71	5.98	185.81
Storage vessel	.00	.00	.00
Boiler furnace	1,362.77	3.76	109.02
Water system	.00	.00	.00
Compressor	392.17	7.19	31.37
Pressure washer	600.60	4.05	48.05
Fuel tank	.00	.00	.00
Scales	496.93	4.81	57.15
Barrels	3,361.00	2.60	386.52
Barrel loader	.00	.00	.00
Carts	307.62	7.57	35.38
Fencers / shockers	338.10	1.05	38.88
Shop tools	2,232.38	6.26	256.72
Staplers	173.57	4.79	19.96
Office equipment	.00	.00	.00
Lawn mower	1,190.36	5.83	95.23
Over-wintering insulation	4,112.53	6.19	472.94
Miscellaneous equipment	.00	.00	.00
Equipment subtotal	133,649.16		14,322.74
Trucks	46,479.76	12.72	.00
Tractors	.00	.00	1,562.38
Other machinery	14,371.33	7.55	5,280.76
TOTAL INVESTMENT	563,591.19		32,347.26

Group VII (400 to 1,000 hives):

The average costs and returns for this group presented in tables 20 and 21 are based on data from 14 honey study participants.

The average number of hives for this group of 14 beekeepers was 672 hives and their average yield was estimated at 126 pounds, one pound higher when compared with the average yield of all 57 honey participants across the province and 25 pounds higher than the provincial average of 101 pounds shown in table 5. Average honey production for this group was 84,372 pounds.

Total value of production:

As shown in table 20, total value of production including wax/pollen and miscellaneous receipts for this group amounted to \$277,807 per average beekeeper. This translates to approximately \$414 per hive or \$3.29 per pound of honey produced.

Variable costs:

Average variable costs per study participant in Group VII was estimated at \$192,865. This translates to approximately \$287 per hive or \$2.29 per pound of honey produced.

Capital costs:

Average capital costs for Group VII participants amounted to \$84,658 per operation. This translates to approximately \$126 per hive or \$1.00 per pound of honey produced.

Cash costs:

Average cash costs (all out of pocket costs incurred during the honey production period) amounted to \$163,099 per each Group VII operation. This translates to \$243 per hive or \$1.93 per pound of honey produced.

Total production costs:

Average total production cost for study participants was estimated at \$277,523 per beekeeping operation. This translates to \$413 per hive or \$3.29 per pound of honey produced.

Management indicators:

Average gross margin per beekeeping operation in Group VII was positive at \$114,708 (\$171 per hive or \$1.36 per pound of honey produced). Average return to equity was positive at \$284 per hive respectively. Details on management indicators are presented in table 20.

Investment costs:

Average total investment for land, buildings, bee equipment and machinery (vehicles) for Group VII amounted to \$1,119,687 per operation or \$1,667 per hive. Details on land, buildings, bee equipment, machinery and vehicle investment costs for this group are presented in table 21.

TABLE 20: HONEY PRODUCTION COSTS AND RETURNS BY SIZE (400 TO 1,000 HIVES), 2022

(A)			Total \$	\$/Hive	\$/Lb.
1.	Bulk honey sales	82,524.14 lbs.	243,052.46	361.92	2.95
2.	Bulk honey inventory	94.29 lbs.	292.29	.44	
3.	Consumer pack sales	1,532.14 lbs.	6,067.50	9.03	
4.	Consumer pack inventory	221.43 lbs.	780.36	1.16	
5.	Other honey sales	0.00 lbs.	.00	.00	
6.	Wax/pollen/other sales	1,085.71 lbs.	5,107.14	7.60	
7.	Bee sales		10,078.57	15.01	
8.	Bee/honey insurance receipts		6,428.57	9.57	
9.	Miscellaneous receipts		6,000.00	8.93	
10.	Less: Honey purchase for resale		.00	.00	
11.	Hive rental - Pollination		.00	.00	
VALUE OF PRODUCTION			277,806.89	413.67	3.29
(B)					
1.	Bee purchases - Package bees		821.43	1.22	
2.	Bee purchases - Queens		11,894.29	17.71	
3.	Bee purchases - Nucs		8,035.71	11.97	
4.	Freight and trucking		1,953.57	2.91	
5.	Sugar for feeding		20,435.71	30.43	
6.	Pollen supplement feeding		2,157.14	3.21	
7.	Medicine/bee repellent		4,685.71	6.98	
8.	Bee/honey insurance		1,528.57	2.28	
9.	Fuel		9,285.71	13.83	
10.	Repairs - Machine		2,325.00	3.46	
11.	Repairs - Buildings and improvements		2,107.14	3.14	
12.	Utilities and heating fuel		6,872.86	10.23	
13.	Custom work and machine rental		6,785.71	10.10	
14.	Association dues, professional fees, promotion and travel		4,794.64	7.14	
15.	Small tools, supplies and miscellaneous expenses		4,928.57	7.34	
16.	Operating interest paid		107.14	.16	
17.	Paid labour and benefits	3,301.67 hours	58,547.93	87.18	
18.	Unpaid labour	2,171.33 hours	45,597.99	67.90	
VARIABLE COSTS			192,864.85	287.18	2.29
(C)					
1.	Land rent / Lease, building rent and forage Access		2,239.36	3.33	
2.	Taxes, licences and general insurance		12,471.43	18.57	
3.	Equipment and buildings				
	a) Depreciation		68,825.86	102.48	
	b) Lease payments		.00	.00	
4.	Paid capital interest		1,121.43	1.67	
TOTAL CAPITAL COSTS			84,658.07	126.06	1.00
(D)	CASH COSTS	(B+C-B18-C3a)	163,099.08	242.86	1.93
(E)	TOTAL PRODUCTION COSTS	(B+C)	277,522.92	413.24	3.29
(F)	GROSS MARGIN	(A-D)	114,707.82	170.81	1.36
	RETURN TO UNPAID LABOUR	(A-E+B18)	45,881.96	68.32	.54
	RETURN TO INVESTMENT	(A-E+C4)	1,405.40	2.09	.02
	RETURN TO EQUITY	(A-E)	283.97	.42	.00
MANAGEMENT					
	Number of hives			671.57	
	Average yield per hive (lbs.)			125.63	
	Honey produced (lbs.)			84,372.00	

TABLE 21: HONEY PRODUCTION ENTERPRISE INVESTMENT, BY SIZE (400 TO 1,000 HIVES), 2022

INVESTMENT SUMMARY:	Total \$		\$/Hive
Land	182,160.58		271.25
Buildings	514,000.00		765.37
Bee equipment	288,168.86		429.10
Machinery	135,357.14		201.55
TOTAL INVESTMENT	1,119,687		1,667

INVESTMENT DETAIL:	Enterprise value (\$)	Age (years)	Depreciation (\$)
Land	182,160.58		
Honey house	309,285.71	16.93	15,464.29
Wintering shed	94,071.43	6.50	4,703.57
Houses (25%)	82,857.14	32.29	4,142.86
Other buildings	27,785.71	12.75	1,389.29
Buildings Subtotal	514,000.00		25,700.00
Hives	184,771.43	9.07	21,248.71
Pallets	9,242.86	8.14	1,062.93
Forklift	14,821.43	16.43	1,185.71
Hive feeders	9,878.57	4.43	1,136.04
Super elevator	.00	.00	.00
Uncapping machines	8,892.86	10.79	711.43
Honey extractor	13,214.29	11.64	1,057.14
Dryer/heat exchanger	3,642.86	9.21	291.43
Wax spinner/separator	3,642.86	10.50	291.43
Honey tank and pipe	5,535.71	13.57	636.61
Feed tank	4,135.71	9.29	475.61
Storage vessel	.00	.00	.00
Boiler furnace	2,100.00	5.50	168.00
Water system	.00	.00	.00
Compressor	400.00	7.29	32.00
Pressure washer	814.29	3.50	65.14
Fuel tank	.00	.00	.00
Scales	964.29	5.79	110.89
Barrels	8,723.14	.86	1,003.16
Barrel loader	.00	.00	.00
Carts	482.14	10.14	55.45
Fencers / shockers	785.71	1.36	90.36
Shop tools	4,964.29	7.43	570.89
Staplers	243.93	5.07	28.05
Office equipment	.00	.00	.00
Lawn mower	2,637.50	4.71	211.00
Over-wintering insulation	8,275.00	7.00	951.63
Miscellaneous equipment	.00	.00	.00
Equipment subtotal	288,168.86		31,383.61
Trucks	102,957.14	14.47	.00
Tractors	.00	.00	3,579.25
Other machinery	32,400.00	5.46	11,815.82
TOTAL INVESTMENT	1,119,686.58		68,899.43

Group VIII (100 to 399 hives):

The average costs and returns for this group presented in tables 22 and 23 are based on data from 12 honey study participants.

The average number of hives for this group was 183 hives and their average yield was estimated at 133 pounds, eight pounds higher when compared with the average yield of all 57 honey participants across the province and 32 pounds higher than the provincial average of 101 pounds shown in table 5. Average honey production for this group was 24,183 pounds.

Total value of production:

As shown in table 22, the total value of production including wax/pollen and miscellaneous receipts for this group amounted to \$73,162 per average beekeeper. This translates to approximately \$401 per hive or \$3.03 per pound of honey produced.

Variable costs:

Average variable costs per study participant in Group VIII was estimated at \$51,288. This translates to approximately \$281 per hive or \$2.12 per pound of honey produced.

Capital costs:

Average capital costs for Group VIII participants amounted to \$28,525 per operation. This translates to approximately \$156 per hive or \$1.18 per pound of honey produced.

Cash costs:

Average cash costs (all out of pocket costs incurred during the honey production period) amounted to \$35,332 per each Group VIII operation. This translates to \$194 per hive or \$1.46 per pound of honey produced.

Total production costs:

Average total production cost for study participants was estimated at \$79,813 per beekeeping operation. This translates to \$437 per hive or \$3.30 per pound of honey produced.

Management indicators:

As presented in table 22, only gross margin and return to unpaid labour were positive. The average gross margin per beekeeping operation in Group VIII was estimated at \$37,830 (\$207 per hive or \$1.56 per pound of honey produced) while return to unpaid labour was estimated at \$13,589 (\$74 per hive or \$0.56 per pound of honey produced).

Investment costs:

Average total investment for land, buildings, bee equipment and machinery (vehicles) for Group VIII amounted to \$520,160 per operation or \$2,850 per hive. Details on land, buildings, bee equipment, machinery and vehicle investment costs for this group are presented in table 23.

TABLE 22: HONEY PRODUCTION COSTS AND RETURNS BY SIZE (100 TO 399 HIVES), 2022

(A)		Total \$	\$/Hive	\$/Lb.	
1.	Bulk honey sales	20,374.73 lbs.	58,062	318.15	2.85
2.	Bulk honey inventory	1,200.00 lbs.	4,691	25.70	
3.	Consumer pack sales	2,608.45 lbs.	8,866	48.58	
4.	Consumer pack inventory	.00 lbs.	.00	.00	
5.	Other honey sales	.00 lbs.	.00	.00	
6.	Wax/pollen/other sales	40.91 lbs.	160	.88	
7.	Bee sales		1,240	6.79	
8.	Bee/honey insurance receipts		.00	.00	
9.	Miscellaneous receipts		142	.78	
10.	Less: Honey purchase for resale		.00	.00	
11.	Hive rental - pollination		.00	.00	
VALUE OF PRODUCTION			73,162	400.89	3.03
(B)					
1.	Bee purchases - Package bees		2,698	14.78	
2.	Bee purchases - Queens		3,041	16.66	
3.	Bee purchases - Nucs		.00	.00	
4.	Freight and trucking		440	2.41	
5.	Sugar for feeding		5,600	30.68	
6.	Pollen supplement feeding		436	2.39	
7.	Medicine/bee repellent		755	4.14	
8.	Bee/honey insurance		.00	.00	
9.	Fuel		3,315	18.17	
10.	Repairs - Machine		282	1.54	
11.	Repairs - Buildings and improvements		291	1.59	
12.	Utilities and heating fuel		3,817	20.92	
13.	Custom work and machine rental		1,850	10.14	
14.	Association dues, professional fees, promotion and travel		890	4.88	
15.	Small tools, supplies and miscellaneous expenses		2,479	13.58	
16.	Operating interest paid		2,230	12.22	
17.	Paid labour and benefits	159.25 hours	2,925	16.03	
18.	Unpaid labour	963.83 hours	20,241	110.91	
VARIABLE COSTS			51,288	281.03	2.12
(C)					
1.	Land rent / lease, building rent and forage access		730	4.00	
2.	Taxes, licences and general insurance		3,133	17.17	
3.	Equipment and buildings	a) Depreciation	24,241	132.83	
		b) Lease payments	.00	.00	
4.	Paid capital interest		421	2.31	
TOTAL CAPITAL COSTS			28,525	156.30	1.18
(D)	CASH COSTS	(B+C-B18-C3a)	35,332	193.60	1.46
(E)	TOTAL PRODUCTION COSTS	(B+C)	79,813	437.33	3.30
(F)	GROSS MARGIN	(A-D)	37,830	207.29	1.56
	RETURN TO UNPAID LABOUR	(A-E+B18)	13,589	74.46	.56
	RETURN TO INVESTMENT	(A-E+C4)	-6,231	-34.14	-.26
	RETURN TO EQUITY	(A-E)	-6,652	-36.45	-.28
MANAGEMENT					
	Number of hives		183		
	Average yield per hive (lbs.)		133		
	Honey produced (lbs.)		24,183		

TABLE 23: HONEY PRODUCTION ENTERPRISE INVESTMENT BY SIZE (100 TO 399 HIVES), 2022

INVESTMENT SUMMARY:	Total \$		\$/Hive
Land	166,750.00		913.70
Buildings	218,198.86		1,195.61
Bee equipment	104,429.30		572.22
Machinery	30,781.67		168.67
TOTAL INVESTMENT	520,159.83		2,850.19
INVESTMENT DETAIL:	Enterprise value (\$)	Age (years)	Depreciation (\$)
Land	166,750.00		
Honey house	113,636.36	18.25	5,681.82
Wintering shed	24,916.67	10.42	1,245.83
Houses (25%)	59,437.50	22.25	2,971.88
Other buildings	20,208.33	14.12	1,010.42
Buildings subtotal	218,198.86		10,909.94
Hives	55,972.73	8.50	6,436.86
Pallets	1,363.58	4.08	156.81
Forklift	13,516.67	5.25	1,081.33
Hive feeders	1,048.33	2.92	120.56
Super elevator	.00	.00	.00
Uncapping machines	5,272.73	10.08	421.82
Honey extractor	10,000.00	12.42	800.00
Dryer/heat exchanger	1,083.33	.08	86.67
Wax spinner/separator	2,500.00	3.83	200.00
Honey tank and pipe	2,027.27	6.17	233.14
Feed tank	604.17	5.08	69.48
Storage vessel	.00	.00	.00
Boiler furnace	2,136.36	3.50	170.91
Water system	.00	.00	.00
Compressor	659.09	6.25	52.73
Pressure washer	756.25	5.08	60.50
Fuel tank	.00	.00	.00
Scales	440.91	4.83	50.70
Barrels	618.18	3.08	71.09
Barrel loader	.00	.00	.00
Carts	407.50	8.67	46.86
Fencers / shockers	.00	.00	.00
Shop tools	1,600.00	7.25	184.00
Staplers	190.83	4.33	21.95
Office equipment	.00	.00	.00
Lawn mower	620.00	5.00	49.60
Over-wintering insulation	3,611.36	7.17	415.31
Miscellaneous equipment	.00	.00	.00
Equipment subtotal	104,429.30		10,730.31
Trucks	23,633.33	17.65	.00
Tractors	.00	.00	710.18
Other machinery	7,148.33	4.59	2,600.84
TOTAL INVESTMENT	520,159.83		24,241.10

Group IX (Less than 100 hives):

The average costs and returns for this group presented in tables 24 and 25 are based on data from 16 honey study participants.

As shown in table 24, each beekeeper in Group IX operated 20 hives and their average yield was estimated at 132 pounds per hive. The average yield for Group IX participants were seven pounds higher compared with the average yield of all 57 honey participants across the province and 31 pounds higher compared with the provincial average of 101 pounds shown in table 5. Average honey production for this group was 2,684 pounds.

Total value of production:

As shown in table 24, total value of production including wax/pollen and miscellaneous receipts for this group amounted to \$16,252. This translates to approximately \$800 per hive or \$6.06 per pound of honey produced.

Variable costs:

Average variable costs per study participant in Group IX was estimated at \$12,166. This translates to approximately \$599 per hive or \$4.53 per pound of honey produced.

Capital costs:

Average capital costs for Group IX participants amounted to \$8,907 per operation. This translates to approximately \$439 per hive or \$3.32 per pound of honey produced.

Cash costs:

Average cash costs (all out of pocket costs incurred during the honey production period) amounted to \$10,256 per each Group IX operation. This translates to \$505 per hive or \$3.82 per pound of honey produced.

Total production costs:

Average total production cost for study participants was estimated at \$21,073 per beekeeping operation. This translates to \$1,037 per hive or \$7.85 per pound of honey produced.

Management indicators:

As presented in table 24, only gross margin was positive. Gross margin for Group IX participants was estimated at \$5,996 per average beekeeping operation. This translates to \$295 per hive or \$2.23 per pound of honey produced. Details on management indicators are presented in table 24.

Investment costs:

Average total investment for land, buildings, bee equipment and machinery (vehicles) for Group IX amounted to \$109,581 per operation or \$5,395 per hive. Details on land, buildings, bee equipment, machinery and vehicle investment costs for this group are presented in table 25.

TABLE 24: HONEY PRODUCTION COSTS AND RETURNS BY SIZE (LESS THAN 100 HIVES), 2022

(A)		Total \$	\$/Hive	\$/Lb.	
1.	Bulk honey sales	2,100.00 lbs.	10,591.25	521.42	5.04
2.	Bulk honey inventory	269.13 lbs.	1,100.75	54.19	
3.	Consumer pack sales	298.25 lbs.	1,488.50	73.28	
4.	Consumer pack inventory	16.25 lbs.	75.00	3.69	
5.	Other honey sales	.00 lbs.	.00	.00	
6.	Wax/pollen/other sales	25.63 lbs.	412.50	20.31	
7.	Bee sales		2,583.75	127.20	
8.	Bee/honey insurance receipts		.00	.00	
9.	Miscellaneous receipts		.00	.00	
10.	Less: honey purchase for resale		.00	.00	
11.	Hive rental - Pollination		.00	.00	
VALUE OF PRODUCTION			16,251.75	800.09	6.06
(B)					
1.	Bee purchases - Package bees		1,220.38	60.08	
2.	Bee purchases - Queens		559.13	27.53	
3.	Bee purchases - Nucs		640.63	31.54	
4.	Freight and trucking		.00	.00	
5.	Sugar for feeding		814.50	40.10	
6.	Pollen supplement feeding		201.81	9.94	
7.	Medicine/bee repellent		275.94	13.58	
8.	Bee/honey insurance		55.00	2.71	
9.	Fuel		741.25	36.49	
10.	Repairs - Machine		80.00	3.94	
11.	Repairs - Buildings and improvements		128.13	6.31	
12.	Utilities and heating fuel		1,128.47	55.56	
13.	Custom work and machine rental		.00	.00	
14.	Association dues, professional fees, promotion and travel		245.31	12.08	
15.	Small tools, supplies and miscellaneous expenses		867.69	42.72	
16.	Operating interest paid		250.00	12.31	
17.	Paid labour and benefits	28.75 hours	583.75	28.74	
18.	Unpaid labour	215.06 hours	4,373.73	215.32	
VARIABLE COSTS			12,165.71	598.93	4.53
(C)					
1.	Land rent / lease, building rent and forage access		111.56	5.49	
2.	Taxes, licences and general insurance		2,306.25	113.54	
3.	Equipment and buildings	A) Depreciation	6,443.74	317.23	
		B) Lease payments	.00	.00	
4.	Paid Capital Interest		45.75	2.25	
TOTAL CAPITAL COSTS			8,907.31	438.51	3.32
(D)	CASH COSTS	(B+C-B18-C3a)	10,255.54	504.89	3.82
(E)	TOTAL PRODUCTION COSTS	(B+C)	21,073.01	1,037.44	7.85
(F)	GROSS MARGIN	(A-D)	5,996.22	295.20	2.23
	RETURN TO UNPAID LABOUR	(A-E+B18)	-447.53	-22.03	-1.17
	RETURN TO INVESTMENT	(A-E+C4)	-4,775.51	-235.10	-1.78
	RETURN TO EQUITY	(A-E)	-4,821.26	-237.35	-1.80
MANAGEMENT					
	Number of hives		20.31		
	Average yield per hive (lbs.)		132.12		
	Honey produced (lbs.)		2,683.63		

TABLE 25: HONEY PRODUCTION ENTERPRISE INVESTMENT BY SIZE (LESS THAN 100 HIVES), 2022

INVESTMENT SUMMARY:	Total \$		\$/Hive
Land	15,363.13		756.34
Buildings	55,648.44		2,739.62
Bee equipment	20,359.31		1,002.30
Machinery	18,210.38		896.51
TOTAL INVESTMENT	109,581.25		5,394.77
INVESTMENT DETAIL:	Enterprise value (\$)	Age (years)	Depreciation (\$)
Land	15,363.13		
Honey house	16,843.75	17.25	842.19
Wintering shed	8,062.50	6.31	403.13
Houses (25%)	29,492.19	18.13	1,474.61
Other buildings	1,250.00	9.69	62.50
Buildings subtotal	55,648.44		2,782.42
Hives	9,016.88	10.56	1,036.94
Pallets	402.63	3.63	46.30
Forklift	2,241.25	2.62	179.30
Hive feeders	456.25	8.69	52.47
Super elevator	.00	.00	.00
Uncapping machines	374.38	4.63	29.95
Honey extractor	2,534.38	9.44	202.75
Dryer/heat exchanger	500.00	2.19	40.00
Wax spinner/separator	593.75	1.56	47.50
Honey tank and pipe	701.25	5.31	80.64
Feed tank	169.38	3.75	19.48
Storage vessel	.00	.00	.00
Boiler furnace	137.50	2.44	11.00
Water system	.00	.00	.00
Compressor	185.13	7.81	14.81
Pressure washer	296.88	3.75	23.75
Fuel tank	.00	.00	.00
Scales	130.00	3.94	14.95
Barrels	726.25	3.75	83.52
Barrel loader	.00	.00	.00
Carts	80.00	4.50	9.20
Fencers / shockers	200.00	1.56	23.00
Shop tools	316.25	4.50	36.37
Staplers	99.06	4.88	11.39
Office equipment	.00	.00	.00
Lawn mower	351.88	7.44	28.15
Over-wintering insulation	846.25	4.75	97.32
Miscellaneous equipment	.00	.00	.00
Equipment subtotal	20,359.31		2,088.79
Trucks	14,196.88	7.51	.00
Tractors	.00	.00	436.78
Other machinery	4,013.50	11.59	1,572.53
TOTAL INVESTMENT	109,581.25		6,443.74

Group X (More than 1,000 hives):

The average costs and returns for Group X presented in tables 26 and 27 are based on data from 15 honey study participants.

On average, the beekeepers in Group X operated 3,296 hives and their average yield was estimated at 124 pounds, one pound lower than the average yield of all 57 honey participants across the province and 23 pounds higher than the provincial average of 101 pounds shown in table 5. Average honey production for this group was estimated at 408,976 pounds.

Total value of production:

As shown in table 26, total value of production including wax/pollen and miscellaneous receipts for this group amounted to \$1,353,280. This translates to approximately \$411 per hive or \$3.31 per pound of honey produced.

Variable costs:

Average variable costs per study participant in Group X was estimated at \$860,473. This translates to approximately \$261 per hive or \$2.10 per pound of honey produced.

Capital costs:

Average capital costs for Group X participants amounted to \$340,704 per operation. This translates to approximately \$103 per hive or \$0.83 per pound of honey produced.

Cash costs:

Average cash costs (all out of pocket costs incurred during the honey production period) amounted to \$872,073 per each beekeeping operation in Group X. This translates to \$265 per hive or \$2.13 per pound of honey produced.

Total production costs:

Average total production cost for study participants was estimated at \$1,201,177 per beekeeping operation. This translates to \$364 per hive or \$2.94 per pound of honey produced.

Management indicators:

As presented in table 27, all the net returns estimated for Group X participants were positive. Average gross margin per operation was estimated at \$481,207. This translates to approximately \$146 per hive or \$1.18 per pound of honey produced. Average return to unpaid labour was positive at \$213,179 per study participant. In terms of return to unpaid labour per hive, it amounted to \$65 or \$0.52 per pound of honey produced. Average return to investment was estimated at \$162,234 per operation or \$49 per hive or \$0.40 per pound of honey produced. Return to equity per operation was \$152,104 per average beekeeper or \$46 per hive or \$0.37 per pound of honey produced.

Investment costs:

Average total investment for land, buildings, bee equipment and machinery (vehicles) for Group X amounted to \$3,728,609 per operation or \$1,131 per hive. Details on land, buildings, bee equipment, machinery and vehicle investment costs for this group are presented in table 27.

TABLE 26: HONEY PRODUCTION COSTS AND RETURNS BY SIZE (MORE THAN 1,000 HIVES), 2022

(A)		Total \$	\$/Hive	\$/Lb.	
1.	Bulk honey sales	392,176.07 lbs.	1,193,106.28	362.04	3.04
2.	Bulk honey inventory	8,400.00 lbs.	26,726.67	8.11	
3.	Consumer pack sales	2,600.00 lbs.	11,893.33	3.61	
4.	Consumer pack inventory	800.00 lbs.	2,400.00	.73	
5.	Other honey sales	5,000.00 lbs.	15,750.00	4.78	
6.	Wax/pollen/other sales	5,993.27 lbs.	32,716.52	9.93	
7.	Bee sales		3,072.00	.93	
8.	Bee/honey insurance receipts		6,045.07	1.83	
9.	Miscellaneous receipts		56,730.47	17.21	
10.	Less: honey purchase for resale		1,346.67	.41	
11.	Hive rental – Pollination	21 hives	6,186.67	290.00	
VALUE OF PRODUCTION			1,353,280.33	410.64	3.31
(B)					
1.	Bee purchases - Package bees		33,685.87	10.22	
2.	Bee purchases - Queens		81,557.67	24.75	
3.	Bee purchases - Nucs		50,306.67	15.27	
4.	Freight and trucking		18,085.87	5.49	
5.	Sugar for feeding		104,434.40	31.69	
6.	Pollen supplement feeding		25,235.60	7.66	
7.	Medicine/bee repellent		33,129.53	10.05	
8.	Bee/honey insurance		27,558.33	8.36	
9.	Fuel		34,943.93	10.60	
10.	Repairs - Machine		17,426.47	5.29	
11.	Repairs - Buildings and improvements		13,859.60	4.21	
12.	Utilities and heating fuel		24,931.33	7.57	
13.	Custom work and machine rental		4,522.07	1.37	
14.	Association dues, professional fees, promotion and travel		28,244.40	8.57	
15.	Small tools, supplies and miscellaneous expenses		28,489.93	8.65	
16.	Operating interest paid		4,186.27	1.27	
17.	Paid labour and benefits	14,716.40 hours	268,799.90	81.56	
18.	Unpaid labour	2,908.33 hours	61,075.00	18.53	
VARIABLE COSTS			860,472.83	261.10	2.10
(C)					
1.	Land rent / lease, building rent and forage access		15,037.67	4.56	
2.	Taxes, licences and general insurance		47,407.40	14.39	
3.	Equipment and buildings	a) Depreciation	268,028.42	81.33	
		b) Lease payments	.00	.00	
4.	Paid capital interest		10,230.40	3.10	
TOTAL CAPITAL COSTS			340,703.88	103.38	.83
(D)	CASH COSTS	(B+C-B18-C3a)	872,073.30	264.62	2.13
(E)	TOTAL PRODUCTION COSTS	(B+C)	1,201,176.72	364.49	2.94
(F)	GROSS MARGIN	(A-D)	481,207.03	146.02	1.18
	RETURN TO UNPAID LABOUR	(A-E+B18)	213,178.62	64.69	.52
	RETURN TO INVESTMENT	(A-E+C4) 4.4%	162,334.02	49.26	.40
	RETURN TO EQUITY	(A-E)	152,103.62	46.15	.37
MANAGEMENT					
	Number of hives		3,295.53		
	Average Yield per hive (lbs.)		124.10		
	Honey produced (lbs.)		408,976.07		

TABLE 27: HONEY PRODUCTION ENTERPRISE INVESTMENT BY SIZE (MORE THAN 1,000 HIVES), 2022

INVESTMENT SUMMARY:	Total \$		\$/Hive
Land	315,696.67		95.80
Buildings	1,604,776.67		486.96
Bee equipment	1,351,394.67		410.07
Machinery	456,740.93		138.59
TOTAL INVESTMENT	3,728,608.93		1,131.41

INVESTMENT DETAIL:	Enterprise value (\$)	Age (years)	Depreciation (\$)
Land	315,696.67		
Honey house	393,893.33	19.33	19,694.67
Wintering shed	753,600.00	12.60	37,680.00
Houses (25%)	128,083.33	22.67	6,404.17
Other buildings	329,200.00	27.70	16,460.00
Buildings subtotal	1,604,776.67		80,238.83
Hives	863,400.00	10.73	99,291.00
Pallets	25,906.67	10.27	2,979.27
Forklift	95,033.33	13.57	7,602.67
Hive feeders	49,480.00	7.93	5,690.20
Super elevator	.00	.00	.00
Uncapping machines	25,433.33	11.20	2,034.67
Honey extractor	58,233.33	12.33	4,658.67
Dryer/heat exchanger	15,073.33	8.60	1,205.87
Wax spinner/separator	28,133.33	9.80	2,250.67
Honey tank and pipe	35,800.00	15.67	4,117.00
Feed tank	13,533.33	9.07	1,556.33
Storage vessel	.00	.00	.00
Boiler furnace	18,366.67	7.73	1,469.33
Water system	.00	.00	.00
Compressor	2,440.00	10.27	195.20
Pressure washer	6,293.33	7.20	503.47
Fuel tank	.00	.00	.00
Scales	4,923.33	12.60	566.18
Barrels	18,534.67	2.47	2,131.49
Barrel loader	.00	.00	.00
Carts	1,260.00	10.47	144.90
Fencers / shockers	2,643.33	1.13	303.98
Shop tools	16,733.33	9.27	1,924.33
Staplers	1,903.33	5.00	218.88
Office equipment	.00	.00	.00
Lawn mower	9,086.67	6.80	726.93
Over-wintering insulation	59,183.33	6.73	6,806.08
Miscellaneous equipment	.00	.00	.00
Equipment subtotal	1,351,394.67		146,377.12
Trucks	305,676.33	8.65	21.33
Tractors	266.67	1.20	16,944.87
Other machinery	150,797.93	6.56	41,420.31
TOTAL INVESTMENT	3,728,608.93		268,036.27

SECTION VI

Summary of honey production costs and returns by region and size of operation

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 28 and 29 respectively. Comparison of these costs and returns are also presented in figure 12.

Yield per hive:

Average yield per hive for the 57 honey producers was estimated at 125 pounds during the 2022 production year. This was significantly higher than the provincial average of 101 pounds per hive.

By region as shown in table 28, Group IV (northwest) had the highest yield of approximately 154 pounds per hive. Next was Group II (central) with approximately 117 pounds per hive. Honey producers in Group III (Northeast) was third with an average yield of approximately 115 pounds per hive. Honey producers in Group I (southern) had the lowest yield of 97 pounds per hive.

With regards to size (table 26), the estimated honey yield for beekeepers with 5 to 1,000 hives was 127 pounds compared to the 124 pounds for those with over 1,000 hives. Within the category of beekeepers with 5 to 1,000 hives, smaller operations reported higher average yields compared with operations that managed larger number of hives.

Value of production:

Average total value of production for the 57 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 \$413 per hive.

By region, average total value of production ranged from \$294 per hive in the southern region (Group I) to \$522 per hive in the northwest region (Group IV). The study participants in Group II (central) had the highest price of \$3.10 per pound for their bulk honey sales compared to the other regions. On average, study participants in Group II sold their bulk honey for about seven cents per pound higher compared to the provincial average of \$3.03 per pound.

By size of operation, Group IX (study participants with less than 100 hives) had the highest total value of production. This is because of two main reasons: first, consumer pack sales which typically command higher prices accounted for about 35 per cent of their total value of production and second, they had the highest price of \$5.04 per pound for their bulk honey sales compared to the other size groups. Total value of production per hive was estimated at \$422 for beekeepers with five to 1,000 hives (Group VI) and \$411 for those with more than 1,000 hives (Group X).

Caution is needed when comparing the total value of production by region and size of operation because some of the study participants reported bee sales and rental income.

Total variable costs:

Average variable costs for the study sample of 57 honey producers were estimated at \$268 per hive or \$2.15 per pound of honey produced. The most significant variable costs include labour, bee purchases (i.e., packaged bees, queens and nucs) and expenses associated with sugar for feeding.

Costs associated with bee purchases for the study sample of 57 honey producers were estimated at \$47 per hive or \$0.38 cents per pound of honey produced. This translates to about 18 per cent of total variable cost or 12 per cent of total production costs.

Costs associated with hired labour and sugar for the study sample of 57 honey producers were estimated at \$111 per hive or \$0.89 cents per pound of honey produced. This translates to about 42 per cent of Total Variable Cost, 43 per cent of total cash costs or 29 per cent of total production costs.

By region, average total variable costs ranged from \$233 per hive in the southern region to \$453 per hive in the northeast region.

Costs associated with bee purchases ranged from \$37 per hive (14 per cent of total variable costs or 10 per cent of total production costs) in the northwest region to \$79 per hive in the central region (27 per cent of total variable costs or 19 per cent of total production costs).

Hired labour and sugar for feeding costs ranged from \$94 per hive (31 per cent of total variable costs or 23 per cent of total production costs) in the central region to \$212 per hive in the northeast region (47 per cent of total variable costs or 39 per cent of total production costs).

By size of operation, bee purchases were \$33 per hive for Group VI (5 to 1,000 hives) and \$50 per hive for Group X (over 1,000 hives). Sugar for feeding and hired labour costs were \$103 per hive for Group VI (5 to 1,000 hives) and \$113 per hive for Group X (over 1,000 hives).

Total production costs:

Average total production cost was estimated at \$378 per hive for the study sample of 57 honey producers (\$3.03 per pound of honey produced). These costs ranged from \$345 per hive in the southern region to \$539 per hive in the northeast region.

By size of operation, total production cost was \$435 per hive (\$3.42 per pound) for honey producers with 5 to 1,000 hives and \$365 per hive (\$2.94 per pound) for those with over 1,000 hives.

Management indicators:

All the net returns were positive for the study sample of 57 honey producers. Only the gross margins were positive for all groups (by region and by size of operation). Caution is needed when comparing the net returns by region and size of operation because a small amount of bee sales and rental income is included in the miscellaneous incomes. Details on management indicators for the study sample of 57 honey producers and all groups (by region and size of operation) are presented in tables 28 and 29 respectively.

Investment costs:

As shown in tables 28 and 29 respectively, the average investment per hive for the study sample of 57 beekeepers was estimated at \$1,297.

By region, investment per hive ranged from \$1,054 for producers in Group IV (northwest region) to \$1,679 in Group II (central).

By size of operation, average investment per hive was \$1,986 for Group VI (5 to 1,000 hives) and \$1,131 for Group X (over 1,000 hives). Within the category of beekeepers with 5 to 1,000 hives (Group VI), smaller operations had higher investment costs compared with those that managed larger number of hives.

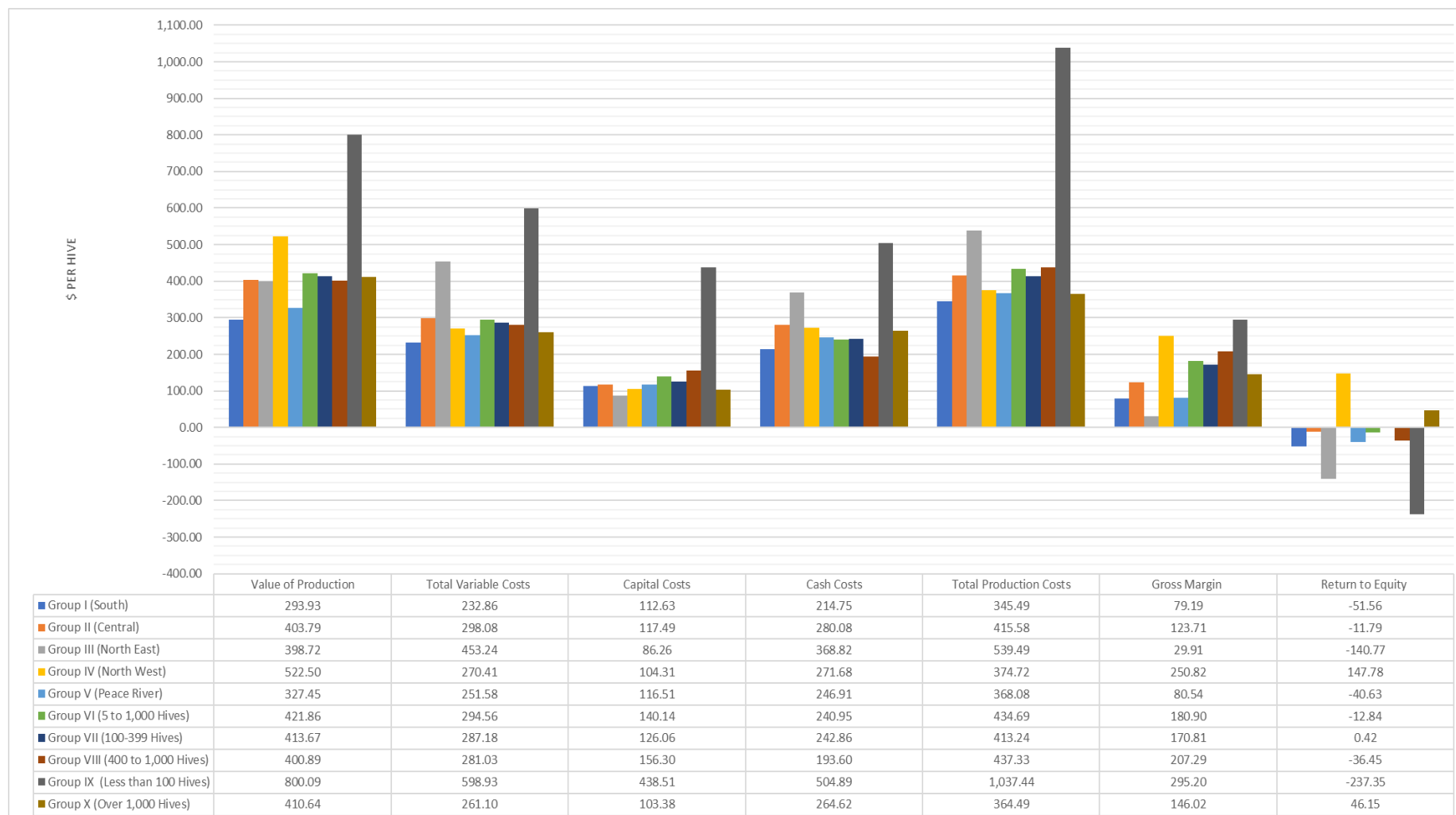
TABLE 28: SUMMARY OF HONEY PRODUCTION COSTS AND RETURNS BY REGION, 2022

	ALBERTA		REGION									
			GROUP I SOUTHERN		GROUP II CENTRAL		GROUP III NORTH-EAST		GROUP IV NORTH-WEST		GROUP V PEACE	
Number of participants	57		6		11		5		20		15	
Average number of hives	1,076		1,261		701		301		1,229		1,332	
Average yield per hive (lbs.)	125		97		117		115		154		103	
Honey produced (lbs.)	134,193		122,390		81,967		34,472		189,312		136,961	
	\$ 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	361.30	3.03	285.44	3.02	339.42	3.10	348.31	3.07	459.06	3.00	279.16	3.07
TOTAL VALUE OF PRODUCTION	412.82	3.31	293.93	3.03	403.79	3.45	398.72	3.48	522.50	3.39	327.45	3.19
Bee Purchases	46.97	0.38	48.97	0.50	79.37	0.68	44.91	0.39	36.59	0.24	46.64	0.45
Feed – sugar	31.51	0.25	35.45	0.37	28.66	0.24	27.99	0.24	35.72	0.23	26.19	0.25
Hired labour	79.81	0.64	77.03	0.79	64.88	0.55	183.83	1.60	83.19	0.54	74.62	0.73
Operator and family labour	30.44	0.24	33.83	0.35	42.73	0.37	95.10	0.83	26.81	0.17	24.00	0.23
Other variable costs	78.89	0.36	37.58	0.39	82.44	0.70	101.40	0.88	88.11	0.57	80.12	0.78
TOTAL VARIABLE COSTS	267.60	2.15	232.86	2.40	298.08	2.55	453.24	3.95	270.41	1.76	251.58	2.45
TOTAL CAPITAL COSTS	110.52	0.89	112.63	1.16	117.49	1.00	86.26	0.75	104.31	0.68	116.51	1.13
TOTAL CASH COSTS	260.03	2.09	214.75	2.21	280.08	2.39	368.82	3.22	271.68	1.76	246.91	2.40
TOTAL PRODUCTION COSTS	378.12	3.03	345.49	3.56	415.58	3.55	539.49	4.71	374.72	2.43	368.08	3.58
MANAGEMENT INDICATORS												
GROSS MARGIN	152.79	1.23	79.19	0.82	123.71	1.06	29.91	0.26	250.82	1.63	80.54	0.78
RETURN TO UNPAID LABOUR	65.13	0.52	-17.73	-0.18	30.95	0.26	-45.67	-0.40	174.59	1.13	-16.63	-0.16
RETURN TO INVESTMENT	37.55	0.30	-51.56	-0.53	-1.70	-0.01	-140.30	-1.22	149.65	0.97	-38.10	-0.37
RETURN TO EQUITY	34.70	0.28	-51.56	-0.53	-11.79	-0.10	-140.77	-1.23	147.78	0.96	-40.63	-0.40
AVERAGE INVESTMENT COSTS	1,297.47	10.41	1,418.06	14.61	1,679.47	14.36	1,195.51	10.43	1,054.41	6.85	1,411.19	13.73
* 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 29: SUMMARY OF HONEY PRODUCTION COSTS AND RETURNS BY SIZE OF OPERATION, 2022

	ALBERTA		SIZE OF OPERATION									
			GROUP VI 5 TO 1,000 HIVES		GROUP VII 400 TO 1000 HIVES		GROUP VIII 100 TO 399 HIVES		GROUP IX 5 TO 99 HIVES		GROUP X OVER 1,000 HIVES	
Number of participants	57		42		14		12		16		15	
Average number of hives	1,076		284		672		183		20		3,296	
Average yield per hive (lb.)	125		127		126		133		132		124	
Honey produced (lb.)	134,193		36,056		84,372		24,183		2,684		408,976	
	\$ 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	361.30	3.03	358.22	2.98	361.92	2.95	318.15	2.85	521.42	5.04	362.04	3.04
TOTAL VALUE OF PRODUCTION	412.82	3.31	421.86	3.32	413.67	3.29	400.89	3.03	800.09	6.06	410.64	3.31
Bee Purchases	46.97	0.38	33.41	0.26	30.90	0.25	31.44	0.24	119.14	0.90	50.23	0.40
Feed – Sugar	31.51	0.25	30.74	0.24	30.43	0.24	30.68	0.23	40.10	0.30	31.69	0.26
Hired labour	79.81	0.64	72.51	0.57	87.18	0.69	16.03	0.12	28.74	0.22	81.56	0.66
Operator and family labour	30.44	0.24	79.82	0.63	67.90	0.54	110.91	0.84	215.32	1.63	18.53	0.15
Other variable costs	78.89	0.36	78.08	0.36	70.78	0.36	91.97	0.36	195.62	0.36	79.08	0.36
TOTAL VARIABLE COSTS	267.60	2.15	294.56	2.32	287.18	2.29	281.03	2.12	598.93	4.53	261.10	2.10
TOTAL CAPITAL COSTS	110.52	0.89	140.14	1.10	126.06	1.00	156.30	1.18	438.51	3.32	103.38	0.83
TOTAL CASH COSTS	260.03	2.09	240.95	1.90	242.86	1.93	193.60	1.46	504.89	3.82	264.62	2.13
TOTAL PRODUCTION COSTS	378.12	3.03	434.69	3.42	413.24	3.29	437.33	3.30	1,037.44	7.85	364.49	2.94
MANAGEMENT INDICATORS												
GROSS MARGIN	152.79	1.23	180.90	1.42	170.81	1.36	207.29	1.56	295.20	2.23	146.02	1.18
RETURN TO UNPAID LABOUR	65.13	0.52	66.98	0.53	68.32	0.54	74.46	0.56	-22.03	-0.17	64.69	0.52
RETURN TO INVESTMENT	37.55	0.30	-11.04	-0.09	2.09	0.02	-34.14	-0.26	-235.10	-1.78	49.26	0.40
RETURN TO EQUITY	34.70	0.28	-12.84	-0.10	0.42	0.00	-36.45	-0.28	-237.35	-1.80	46.15	0.37
AVERAGE INVESTMENT COSTS	1,297.47	10.41	1,986.31	15.63	1,667.26	13.27	2,850.19	21.51	5,394.77	40.83	1,131.41	9.12
* 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 12: HONEY PRODUCTION COSTS AND RETURNS BY REGION AND SIZE, 2022 (DOLLARS PER HIVE)



Efficiency of resource use by honey producers

In managing profitability of honey production, the most important areas of concern are number of hives operated which measure the size of operation, total variable costs and total capital or fixed costs. Labour costs and sugar feeding costs alone, on a per hive basis, translate to about 42 per cent of the average total variable costs for these 57 honey producers. It is therefore 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 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 production function approach (linear and non-linear) is used to fit the 2022 cost of production data collected from the 57 beekeepers who produced only honey. The implicit form of the model estimated is expressed as follows:

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

$$\text{Linear: } Y = \alpha + \alpha_1X_1 + \alpha_2X_2 + \alpha_3X_3 + \alpha_4X_4 + \alpha_5X_5 + u \dots\dots\dots (2)$$

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

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

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 regression results of the non-linear model (equation 4) are presented in table 30.

TABLE 30: MULTIPLE REGRESSION STATISTICS (NON-LINEAR MODEL)

Variables	Coefficients	Standard Error	t Stat	P-value	Elasticities
Intercept	2.9960	1.1093	2.7008	0.0094	3.00
Log (sugar feeding costs)	0.0064	0.0398	0.1596	0.8738	0.01
Log (labour costs)	0.0023	0.0567	0.0400	0.9683	0.00
Log (variable costs)	0.4599	0.2003	2.2962	0.0258**	0.46
Log (capital costs)	0.0130	0.1064	0.1226	0.9029	0.01
Log (number of hives)	0.5637	0.1503	3.7506	0.0005***	0.56
	R Squared	0.9456	F-Statistic	177.2034	
	Adjusted R Squared	0.9402	Significance F	5.57E-31	
	Standard error	0.51342	Observations	57	

*** = Significant at 1%

** = Significant at 5%

* = Significant at 10%

Source: Computed from 2022 Cost of Production Survey Data

As presented in table 30, all the variables had a positive relationship with the total value of production and thus conformed to the positive a-priori expectations.

The regression results show that number of hives operated was significant at all levels of significance (one per cent, five per cent and 10 per cent) with an elasticity of 0.56. This means that a one per cent increase in number of hives will correspondingly increase the total value of production by 0.56 per cent. This high percentage increase relative to other variables suggests that number of hives is an important factor of honey production in Alberta ceteris paribus (i.e., holding other variables constant).

Total variable costs was also found to be significant at both the 5 and 10 per cent levels with an elasticity of 0.46 but not at the one per cent level. Sugar feeding costs, labour costs and total capital costs were not significant at all levels of significance.

The Adjusted R Squared results show that the explanatory variables jointly accounted for about 94 per cent 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 4.04 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 4.04 units).

SECTION VII

Pollination production costs and returns in Alberta, 2022

In Alberta, commercial use of honeybees to pollinate crops started in 1995 with the introduction of transgenic canola (about twenty-eight 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. Annually, about 55,000 to 75,000 honey bee colonies are rented from Alberta beekeepers to pollinate hybrid canola seed production fields in southern Alberta.

Nine (9) beekeepers who rented their hives for pollination purposes provided detailed information on their operations for the 2022 production year. As presented in table 31, each beekeeper in this group managed on average 5,133 hives. The average yield of honey per hive for this group of beekeepers was estimated at approximately 60 pounds, 41 pounds lower than the provincial average of 101 pounds shown in table 5. Average honey production per operation for this group was 308,633 pounds per beekeeping operation.

Before discussing the costs and returns in detail, it is important for readers of this report to note that approximately 57 per cent of the total of 46,193 hives that were managed by these nine beekeepers (26,533 hives) were used for pollination. Therefore, the rental income was generated from an average of 3,013 hives and not the overall average of 5,133 hives. Balance of the income (which was received from honey sales, wax and pollen and miscellaneous receipts) was based on the average of 5,133 pollinating hives. Crops pollinated include canola, blueberry and cranberry.

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 \$946,018. This translates to an average value per hive of \$184 or \$3.07 per pound of honey produced. Average wax and pollen sales and other miscellaneous income amounted to \$301,689 per operation or approximately \$59 per hive.

As presented in table 31, hive rental fee for pollinating crops on average was estimated at \$230. For canola alone, it was estimated at \$300 per hive and for blueberry it was estimated at \$100 per hive.

When average hive rental income from pollination was combined with honey sales, wax and pollen sales and other miscellaneous income, average value of production increased to \$1,939,575 per operation. This translates to \$378 per hive or \$6.28 per pound of honey produced. Details on total value of production (honey and pollination) are presented in table 31.

Variable costs:

Average variable costs for the pollination group of beekeepers was estimated at \$1,225,401 or \$239 per hive or \$3.97 per pound of honey produced. Paid labour and benefits estimated at \$89 per hive was the leading expense item. This was followed by bee purchases and sugar feeding cost.

Capital costs:

Average capital costs for the nine beekeepers in the pollination group was estimated at \$436,156 per operation or \$85 per hive. The most significant cost item for this group was equipment and building depreciation at \$68 per hive.

Cash costs:

Average cash costs for the pollination group of beekeepers amounted to \$1,278,111. This translates to \$249 per hive or \$4.14 per pound of honey produced.

Total production costs:

Average total production costs for the pollination beekeepers group were calculated at \$1,661,557 per operation. In terms of total production cost per hive, it was \$324 for an average pollination operation or \$5.38 per pound of honey produced. Total production cost comprised of 74 per cent variable costs and about 26 per cent capital costs. Details on variable and capital costs are presented in table 31.

Management indicators:

Average gross margin for the pollination group of beekeepers was \$661,464 per operation or \$129 per hive. Return to unpaid labour for this group was positive at \$311,217 per operation (\$61 per hive). Average return to investment and equity were also positive at \$57 and \$54 per hive, respectively. Details on gross margin and return to unpaid labour, investment and equity are presented in table 31.

Investment costs:

Land associated with this group was valued at \$320,733 or \$62 per hive. Building investment per study participant was estimated at \$1,688,022 or \$329 per hive. Bee equipment investment was \$1,879,779 per average operation or \$366 per hive. Machinery investment was based on the per centage use for the business was estimated at \$691,211 or \$135 per hive.

When all of the investment costs were added together, total investment for this group of nine (9) beekeepers amounted to \$4,579,746 per operation or approximately \$892 per hive. Details on investment costs are presented in table 32.

TABLE 31: POLLINATION PRODUCTION COSTS AND RETURNS, ALBERTA, 2022

(A)		Total \$	\$/Hive	\$/Lb.
1.	Bulk honey sales	242,577.42 lbs.	738,081.71	143.80
2.	Bulk honey inventory	65,222.22 lbs.	205,450.00	40.03
3.	Consumer pack sales	555.56 lbs.	1,666.67	.32
4.	Consumer pack inventory	277.78 lbs.	819.44	.16
5.	Other honey sales	0.00 lbs.	.00	.00
6.	Wax/pollen/other sales	11,722.22 lbs.	66,111.11	12.88
7.	Bee sales		95,577.78	18.62
8.	Bee/honey insurance receipts		95,555.56	18.62
9.	Miscellaneous receipts		44,444.44	8.66
10.	Less: Honey purchase for resale		1,666.67	.32
11.	Hive rental - Pollination	3,013 hives	693,535.00	230.19
VALUE OF PRODUCTION			1,939,575.05	377.90
(B)				6.28
1.	Bee purchases- Package bees		85,777.78	16.71
2.	Bee purchases- Queens		147,733.33	28.78
3.	Bee purchases- Nucs		27,777.78	5.41
4.	Freight and trucking		57,088.89	11.12
5.	Sugar for feeding		158,424.11	30.87
6.	Pollen supplement feeding		29,688.89	5.78
7.	Medicine/bee repellent		71,055.56	13.84
8.	Bee/honey insurance		7,222.22	1.41
9.	Fuel		48,500.00	9.45
10.	Repairs - Machine		9,000.00	1.75
11.	Repairs - Buildings & improvements		7,888.89	1.54
12.	Utilities and heating fuel		21,414.22	4.17
13.	Custom work and machine rental		1,277.78	.25
	Association dues, professional fees, promotion and travel		29,166.67	5.68
14.	Small tools, supplies and miscellaneous expenses		16,750.00	3.26
15.	Operating interest paid		14,955.56	2.91
16.	Paid labour and benefits	21,040.33 hours	458,480.85	89.33
17.	Unpaid labour	1,580.89 hours	33,198.67	6.47
VARIABLE COSTS			1,225,401.18	238.75
(C)				3.97
1.	Land rent / lease, building rent and forage access		23,055.56	4.49
2.	Taxes, licences and general insurance		50,186.44	9.78
3.	Equipment and buildings	a) Depreciation	350,246.91	68.24
		b) Lease payments	.00	.00
4.	Paid capital interest		12,666.67	2.47
TOTAL CAPITAL COSTS			436,155.57	84.98
(D)	CASH COSTS	(B+C-B18-C3a)	1,278,111.18	249.02
(E)	TOTAL PRODUCTION COSTS	(B+C)	1,661,556.76	323.73
(F)	GROSS MARGIN	(A-D)	661,463.86	128.88
	RETURN TO UNPAID LABOUR	(A-E+B18)	311,216.96	60.64
	RETURN TO INVESTMENT	(A-E+C4)	290,684.96	56.64
	RETURN TO EQUITY	(A-E)	278,018.29	54.17

MANAGEMENT

Number of hives	5,132.56
Average yield per hive (lbs.)	60.13
Honey produced (lbs.)	308,632.98

TABLE 32: POLLINATION PRODUCTION ENTERPRISE INVESTMENT, ALBERTA, 2022

INVESTMENT SUMMARY:		Total \$	\$/Hive
Land	87,54 acres	320,733.33	62.49.
Buildings		1,688,022.22.	328.89.
Bee equipment		1,879,778.89.	366.25.
Machinery		691,211.11.	134.67.
TOTAL INVESTMENT		4,579,746.56	892.29

INVESTMENT DETAIL:	Enterprise value (\$)	Age (years)	Depreciation (\$)
Land	320,733.33		
Honey house	533,333.33	5.22	26,666.67
Wintering shed	555,555.56	13.22	27,777.78
Houses (25%)	137,500.00	12.78	6,875.00
Other building	461,633.33	18.81	23,081.67
Buildings Subtotal	1,688,022.22		84,401.11
Hives	1,070,000.00	7.89	123,050.00
Pallets	152,500.00	6.89	17,537.50
Forklift	121,333.33	10.11	9,706.67
Hive feeders	146,383.33	7.67	16,834.08
Super elevator	.00	.00	.00
Uncapping machines	19,777.78	8.11	1,582.22
Honey extractor	76,555.56	13.22	6,124.44
Dryer/heat exchanger	9,888.89	5.00	791.11
Wax spinner/separator	25,555.56	6.22	2,044.44
Honey tank and pipe	42,888.89	8.56	4,932.22
Feed tank	51,388.89	10.33	5,909.72
Storage vessel	.00	.00	.00
Boiler furnace	10,555.56	5.44	844.44
Water system	.00	.00	.00
Compressor	2,566.67	5.33	205.33
Pressure washer	7,777.78	4.67	622.22
Fuel tank	.00	.00	.00
Scales	4,144.44	6.56	476.61
Barrels	14,022.22	1.44	1,612.56
Barrel loader	.00	.00	.00
Carts	844.44	9.56	97.11
Fencers / shockers	166.67	.56	19.17
Shop tools	26,006.67	6.67	2,990.77
Staplers	1,711.11	5.33	196.78
Office equipment	.00	.00	.00
Lawn mower	2,988.89	3.89	239.11
Over-wintering insulation	92,722.22	5.33	10,663.06
Miscellaneous equipment	.00	.00	.00
Equipment subtotal	1,879,778.89		206,479.57
Trucks	534,500.00	9.62	1,155.56
Tractors	14,444.44	1.56	15,590.67
Other machinery	142,266.67	5.62	59,506.22
TOTAL INVESTMENT	4,579,745.56		350,386.91

Pollination production costs and returns - Southern and central region:

Results presented in tables 33 and 34 are based on data from five beekeepers in the southern and central regions that rented their hives for pollination and produced honey. The size of each beekeeping operation in this category was 4,989 hives. Honey production for this group was estimated at 53 pounds per hive, seven pounds lower than the average of all the nine pollination participants and 48 pounds lower than the provincial average of 101 pounds shown in table 5. Average honey production for this group was estimated at 265,725 pounds.

Total value of production:

Average value of honey sales including wax and miscellaneous receipts for these beekeepers were \$867,230 per beekeeper or 174 per hive (\$3.26 per pound). When hive rental income was added to the value of honey, wax and other receipts, the total value of production amounted to \$1,723,393 or \$345 per hive or \$6.49 per pound of honey produced. Note that the rental income presented in table 33 is based on an average of 3,913 hives and not the overall average of 4,989 hives.

Variable costs:

The Average variable cost for this group of participants was estimated at \$1,122,484 per beekeeper. This translates to \$225 per hive or \$4.22 per pound of honey produced.

Capital costs:

Average capital costs for this group amounted to \$467,594 per operation. This translates to \$94 per hive or \$1.76 per pound of honey produced.

Cash costs:

Average cash costs (all out of pocket costs incurred during the production period) amounted to \$1,178,776 per each pollination operation in the southern and central region. This translates to \$236 per hive or \$4.44 per pound of honey produced.

Total production costs:

The average total production cost for each pollination operation in the southern and central region was estimated at \$1,590,078. This translates to \$319 per hive or \$5.98 per pound of honey produced.

Management indicators:

As presented in table 33, all the estimated net returns were positive. Average gross margin for each the five pollination operations in the southern and central region was estimated at \$544,617. This translates to \$109 per hive or \$2.05 per pound of honey produced. Average return to unpaid labour was positive at \$164,059 or \$33 per hive or \$0.62 per pound of honey produced. Average return to investment was estimated at \$142,315 per operation or \$29 per hive or \$0.54 per pound of honey produced. Return to equity per operation was \$133,315 per average beekeeper or \$27 per hive or \$0.50 per pound of honey produced.

Investment costs:

Average total investment for land, buildings, bee equipment and machinery (vehicles) for each of the five pollination operations in the southern and central region amounted to \$4,968,102 or \$996 per hive. Details on land, buildings, bee equipment, machinery and vehicle investment costs for this group are presented in table 34.

TABLE 33: POLLINATION PRODUCTION COSTS AND RETURNS - SOUTHERN AND CENTRAL REGION, 2022

(A)			Total \$	\$/Hive	\$/Lb.
1.	Bulk honey sales	264,225.26 lbs.	813,224.79	163.02	3.08
2.	Bulk honey inventory	0.00 lbs.	.00	.00	
3.	Consumer pack sales	1,000.00 lbs.	3,000.00	.60	
4.	Consumer pack inventory	500.00 lbs.	1,475.00	.30	
5.	Other honey sales	0.00 lbs.	.00	.00	
6.	Wax/pollen/other sales	4,100.00 lbs.	21,250.00	4.26	
7.	Bee sales		28,280.00	5.67	
8.	Bee/honey insurance receipts		.00	.00	
9.	Miscellaneous receipts		.00	.00	
10.	Less: Honey purchase for resale		.00	.00	
11.	Hive rental – Pollination	3,913 hives	856,163.00	218.79	
VALUE OF PRODUCTION			1,723,392.79	345.47	6.49
(B)					
1.	Bee purchases - Package bees		40,000.00	8.02	
2.	Bee purchases - Queens		104,360.00	20.92	
3.	Bee purchases - Nucs		50,000.00	10.02	
4.	Freight and Trucking		7,000.00	1.40	
5.	Sugar for Feeding		128,800.00	25.82	
6.	Pollen supplement feeding		38,200.00	7.66	
7.	Medicine/bee repellent		96,400.00	19.32	
8.	Bee/honey insurance		1,200.00	.24	
9.	Fuel		47,600.00	9.54	
10.	Repairs - Machine		6,400.00	1.28	
11.	Repairs - Buildings and improvements		6,600.00	1.32	
12.	Utilities and heating fuel		18,240.00	3.66	
13.	Custom work and machine rental		200.00	.04	
14.	Association dues, professional fees, promotion and travel		21,240.00	4.26	
15.	Small tools, supplies and miscellaneous expenses		18,780.00	3.76	
16.	Operating interest paid		10,320.00	2.07	
17.	Paid labour and benefits	22,944.60 hours	496,400.19	99.51	
18.	Unpaid labour	1,464.00 hours	30,744.00	6.16	
VARIABLE COSTS			1,122,484.19	225.01	4.22
(C)					
1.	Land rent / lease, building rent and forage access		29,500.00	5.91	
2.	Taxes, Licences and general Insurance		48,535.60	9.73	
3.	Equipment and buildings	A) Depreciation	380,558.23	76.29	
		B) Lease payments	.00	.00	
4.	Paid capital interest		9,000.00	1.80	
TOTAL CAPITAL COSTS			467,593.83	93.73	1.76
(D)	CASH COSTS	(B+C-B18-C3a)	1,178,775.79	236.29	4.44
(E)	TOTAL PRODUCTION COSTS	(B+C)	1,590,078.02	318.74	5.98
(F)	GROSS MARGIN	(A-D)	544,617.00	109.17	2.05
	RETURN TO UNPAID LABOUR	(A-E+B18)	164,058.77	32.89	.62
	RETURN TO INVESTMENT	(A-E+C4)	142,314.77	28.53	.54
	RETURN TO EQUITY	(A-E)	133,314.77	26.72	.50
MANAGEMENT					
	Number of hives			4,988.60	
	Average yield per hive (lbs.)			53.27	
	Honey produced (lbs.)			265,725.26	

TABLE 34: POLLINATION PRODUCTION ENTERPRISE INVESTMENT - SOUTHERN AND CENTRAL REGION, 2022

INVESTMENT SUMMARY:	Total \$		\$/Hive
Land	263,720.00		52.86
Buildings	2,014,300.00		403.78
Bee equipment	2,075,782.00		416.11
Machinery	614,300.00		123.14
TOTAL INVESTMENT	4,968,102.00		995.89
INVESTMENT DETAIL:	Enterprise value (\$)	Age (years)	Depreciation (\$)
Land	263,720.00		
Honey house	400,000.00	5.40	20,000.00
Wintering shed	890,000.00	14.40	44,500.00
Houses (25%)	150,000.00	4.00	7,500.00
Other building	574,300.00	19.70	28,715.00
Buildings subtotal	2,014,300.00		100,715.00
Hives	1,100,000.00	8.20	126,500.00
Pallets	192,500.00	7.00	22,137.50
Forklift	113,400.00	14.00	9,072.00
Hive feeders	256,250.00	7.80	29,468.75
Super elevator	.00	.00	.00
Uncapping machines	20,200.00	7.60	1,616.00
Honey extractor	80,800.00	13.40	6,464.00
Dryer/heat exchanger	5,600.00	6.00	448.00
Wax spinner/separator	24,000.00	8.20	1,920.00
Honey tank and pipe	51,600.00	9.00	5,934.00
Feed tank	59,500.00	10.60	6,842.50
Storage vessel	.00	.00	.00
Boiler furnace	13,000.00	5.20	1,040.00
Water system	.00	.00	.00
Compressor	1,960.00	6.20	156.80
Pressure washer	8,500.00	5.80	680.00
Fuel tank	.00	.00	.00
Scales	5,800.00	4.80	667.00
Barrels	9,000.00	1.20	1,035.00
Barrel loader	.00	.00	.00
Carts	620.00	7.20	71.30
Fencers / shockers	300.00	1.00	34.50
Shop tools	31,812.00	8.60	3,658.38
Staplers	2,280.00	7.60	262.20
Office equipment	.00	.00	.00
Lawn mower	1,960.00	5.00	156.80
Over-wintering insulation	96,700.00	5.60	11,120.50
Miscellaneous equipment	.00	.00	.00
Equipment subtotal	2,075,782.00		229,285.23
Trucks	565,500.00	8.91	.00
Tractors	.00	.00	5,318.00
Other machinery	48,800.00	5.91	50,558.00
TOTAL INVESTMENT	4,968,102.00		380,558.23

Pollination production costs and returns – Northeast, northwest and peace region:

Results presented in tables 35 and 36 are based on data from four beekeepers in the northeast, northwest and peace region that rented their hives for pollination and also produced honey. The size of each beekeeping operation in this category was 5,313 hives. Honey production for this group was estimated at 68 pounds per hive, eight pounds higher than the average of all the nine pollination participants and 33 pounds lower than the provincial average of 101 pounds shown in table 5. Average honey production for this group was estimated at 362,268 pounds.

Total value of production:

The average value of honey sales including wax and miscellaneous receipts for these beekeepers was \$1,723,303 per beekeeper or 324 per hive (\$4.76 per pound). When hive rental income was added to the value of honey, wax and other receipts, the total value of production amounted to \$2,209,803 or \$416 per hive or \$6.10 per pound of honey produced. Note that the rental income presented in table 35 is based on an average of 1,888 hives and not the overall average of 5,313 hives.

Variable costs:

The average variable cost for this group of participants was estimated at \$1,354,047 per beekeeper. This translates to \$255 per hive or \$3.74 per pound of honey produced.

Capital costs:

Average capital costs for this group amounted to \$396,858 per operation. This translates to \$75 per hive or \$1.10 per pound of honey produced.

Cash costs:

Average cash costs (all out of pocket costs incurred during the honey production period) amounted to \$1,402,280 per each pollination operation in the northeast, northwest and peace region. This translates to \$264 per hive or \$3.87 per pound of honey produced.

Total production costs:

Average total production cost for each pollination operation in the northeast, northwest and peace region was estimated at \$1,750,905. This translates to \$330 per hive or \$4.83 per pound of honey produced.

Management indicators:

As presented in table 35, all the estimated net returns were positive. Average gross margin for each the four pollination operations in the northeast, northwest and peace region was estimated at \$807,522. This translates to \$152 per hive or \$2.23 per pound of honey produced. Average return to unpaid labour was positive at \$495,165 or \$93 per hive or \$1.37 per pound of honey produced. Average return to investment was estimated at \$476,148 per operation or \$90 per hive or \$1.31 per pound of honey produced. Return to equity per operation was \$458,898 per average beekeeper or \$86 per hive or \$1.27 per pound of honey produced.

Investment costs:

Average total investment for land, buildings, bee equipment and machinery (vehicles) for each of the four pollination operations in the northeast, northwest and peace region amounted to \$4,094,300 or \$771 per hive. Details on land, buildings, bee equipment, machinery and vehicle investment costs for this group are presented in table 35.

Based on the results, pollinators surveyed in the northeast, northwest and peace region managed more hives compared with those in the south and central region. In addition, their investment costs were lower and they made more money compared with those in the south and central region.

TABLE 35: POLLINATION PRODUCTION COSTS AND RETURNS - NORTHEAST, NORTHWEST AND PEACE, 2022

(A)		Total \$	\$/Hive	\$/Lb.
1.	Bulk honey sales	215,517.63 lbs.	644,152.88	121.25
2.	Bulk honey inventory	146,750.00 lbs.	462,262.50	87.01
3.	Consumer pack sales	0.00 lbs.	.00	.00
4.	Consumer pack inventory	0.00 lbs.	.00	.00
5.	Other honey sales	0.00 lbs.	.00	.00
6.	Wax/pollen/other sales	21,250.00 lbs.	122,187.50	23.00
7.	Bee sales		179,700.00	33.83
8.	Bee/honey insurance receipts		215,000.00	40.47
9.	Miscellaneous receipts		100,000.00	18.82
10.	Less: Honey purchase for resale		3,750.00	.71
11.	Hive rental - Pollination	1,888 hives	490,250.00	259.74
VALUE OF PRODUCTION			2,209,802.88	415.96
(B)				6.10
1.	Bee purchases- Package bees		143,000.00	26.92
2.	Bee purchases- Queens		201,950.00	38.01
3.	Bee purchases- Nucs		.00	.00
4.	Freight and trucking		119,700.00	22.53
5.	Sugar for Feeding		195,454.25	36.79
6.	Pollen supplement feeding		19,050.00	3.59
7.	Medicine/bee repellent		39,375.00	7.41
8.	Bee/honey insurance		14,750.00	2.78
9.	Fuel		49,625.00	9.34
10.	Repairs - Machine		12,250.00	2.31
11.	Repairs - Buildings and improvements		9,500.00	1.79
12.	Utilities and heating fuel		25,382.00	4.78
13.	Custom work and machine rental		2,625.00	.49
14.	Association dues, professional fees, promotion and travel		39,075.00	7.36
15.	Small tools, supplies and miscellaneous expenses		14,212.50	2.68
16.	Operating interest paid		20,750.00	3.91
17.	Paid labour and benefits	18,660.00 hours	411,081.68	77.38
18.	Unpaid labour	1,727.00 hours	36,267.00	6.83
VARIABLE COSTS			1,354,047.43	254.88
(C)				3.74
1.	Land rent / lease, building rent and forage access		15,000.00	2.82
2.	Taxes, licences and general insurance		52,250.00	9.84
3.	Equipment and buildings	a) Depreciation	312,357.75	58.80
		b) Lease payments	.00	.00
4.	Paid capital interest		17,250.00	3.25
TOTAL CAPITAL COSTS			396,857.75	74.70
(D)	CASH COSTS	(B+C-B18-C3a)	1,402,280.43	263.96
(E)	TOTAL PRODUCTION COSTS	(B+C)	1,750,905.18	329.58
(F)	GROSS MARGIN	(A-D)	807,522.45	152.00
	RETURN TO UNPAID LABOUR	(A-E+B18)	495,164.70	93.21
	RETURN TO INVESTMENT	(A-E+C4)	476,147.70	89.63
	RETURN TO EQUITY	(A-E)	458,897.70	86.38
MANAGEMENT				
	Number of hives		5,312.50	
	Average yield per hive (lbs.)		68.19	
	Honey produced (lbs.)		362,267.63	

TABLE 36: POLLINATION PRODUCTION ENTERPRISE INVESTMENT - NORTHEAST, NORTHWEST AND PEACE, 2022

INVESTMENT SUMMARY:	Total \$		\$/Hive
Land	392,000.00		73.79
Buildings	1,280,175.00		240.97
Bee equipment	1,634,775.00		307.72
Machinery	787,350.00		148.21
TOTAL INVESTMENT	4,094,300.00		770.69

INVESTMENT DETAIL:	Enterprise value (\$)	Age (years)	Depreciation (\$)
Land	392,000.00		
Honey house	700,000.00	5.00	35,000.00
Wintering shed	137,500.00	11.75	6,875.00
Houses (25%)	121,875.00	23.75	6,093.75
Other building	320,800.00	17.70	16,040.00
Buildings subtotal	1,280,175.00		64,008.75
Hives	1,032,500.00	7.50	118,737.50
Pallets	102,500.00	6.75	11,787.50
Forklift	131,250.00	5.25	10,500.00
Hive feeders	9,050.00	7.50	1,040.75
Super elevator	.00	.00	.00
Uncapping machines	19,250.00	8.75	1,540.00
Honey extractor	71,250.00	13.00	5,700.00
Dryer/heat exchanger	15,250.00	3.75	1,220.00
Wax spinner/separator	27,500.00	3.75	2,200.00
Honey tank and pipe	32,000.00	8.00	3,680.00
Feed tank	41,250.00	10.00	4,743.75
Storage vessel	.00	.00	.00
Boiler furnace	7,500.00	5.75	600.00
Water system	.00	.00	.00
Compressor	3,325.00	4.25	266.00
Pressure washer	6,875.00	3.25	550.00
Fuel tank	.00	.00	.00
Scales	2,075.00	8.75	238.63
Barrels	20,300.00	1.75	2,334.50
Barrel loader	.00	.00	.00
Carts	1,125.00	12.50	129.38
Fencers / shockers	.00	.00	.00
Shop tools	18,750.00	4.25	2,156.25
Staplers	1,000.00	2.50	115.00
Office equipment	.00	.00	.00
Lawn mower	4,275.00	2.50	342.00
Over-wintering insulation	87,750.00	5.00	10,091.25
Miscellaneous equipment	.00	.00	.00
Equipment subtotal	1,634,775.00		177,972.50
Trucks	495,750.00	10.51	2,600.00
Tractors	32,500.00	3.50	28,431.50
Other machinery	259,100.00	5.27	70,691.50
TOTAL INVESTMENT	4,094,300.00		312,672.75

SECTION VIII

Bee sales production costs and returns in Alberta, 2022

As previously mentioned in the introduction, five (5) out of the 71 beekeepers who participated in the 2022 study primarily produced honey and sold bees as queens, nucs and hives. In total, 20 beekeepers reported revenues from selling bees (queens, nucs and hives). However, based on the proportion of bee sales to total value of production, only five beekeepers were selected to benchmark the costs and returns for this enterprise. Only one out of these five beekeepers fall within the over 1,000 hives category and the remaining four operations had less than 1,000 hives.

As shown in table 37, the average amount of honey produced for sale per study participant was 31,334 pounds. On average, each beekeeper managed 976 hives and their average yield per hive was estimated at 32 pounds. The queens, nucs and hives were sold at approximately \$39, \$275 and \$300 per unit respectively. Note that this analysis is not applicable for operations that only produce and sell bees.

Value of production:

The average value of honey sales including wax and miscellaneous receipts per beekeeper was estimated at \$116,368. This translates to 119 per hive or \$4.67 per pound of honey produced. Approximately 69 per cent of the honey produced was sold as bulk honey. Income from bee sales was estimated at \$148,500 per operation or \$152 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 \$265,018 or \$272 per hive or \$8.46 per pound of honey produced. Details on value of production (honey and bee sales) are presented in table 37.

Variable costs:

Average variable costs for this group of five beekeepers were estimated at \$411,121 or \$421 per hive or \$13.12 per pound of honey produced. Total labour and benefits estimated at \$1,467 per hive was the leading expense item. This was followed by expenses associated with bee sales.

Capital costs:

The average capital cost for the bee sales group was estimated at \$137,966 per operation. This translates to \$141 per hive or \$4.40 per pound of honey produced. The most significant cost item for this group was equipment and building depreciation at \$86 per hive.

Total production costs:

Average total production costs was calculated at \$549,087 per operation . In terms of total production cost per hive, it was \$563 or \$17.52 per pound of honey produced. Details on variable and capital costs are presented in table 37.

Management indicators:

Because of the low average honey yield per hive, all the estimated net returns were negative. Average gross margin for the bee sales group of beekeepers was -\$148,641 per operation or -\$152 per hive. Details on gross margin and return to unpaid labour, investment and equity are presented in table 37.

Investment costs:

Land associated with this group was valued at \$65,600 or \$67 per hive. Building investment per study participant was estimated at \$447,150 or \$458 per hive. Bee equipment investment was \$471,230 per average operation or \$483 per hive. Machinery investment was based on the per centage use for the business was estimated at \$106,120 or \$109 per hive. When all the investment costs were added together, total investment per operation amounted to \$1,090,000 or approximately \$1,117 per hive. Details on investment costs are presented in table 38.

Based on the above results, the bee sales group of beekeepers suffered more losses compared with the other two enterprises that is honey and pollination.

TABLE 37: BEE SALES PRODUCTION COSTS AND RETURNS, 2022

(A)		Total \$	\$/Hive	\$/Lb.	
1.	Bulk honey sales	21,740.20 lbs	68,250.20	69.93	3.14
2.	Bulk honey inventory	3,330.00 lbs	13,380.00	13.71	
3.	Consumer pack sales	6,264.00 lbs	30,170.88	30.91	
4.	Consumer pack inventory	.00 lbs	.00	.00	
5.	Other honey sales	.00 lbs	.00	.00	
6.	Wax/pollen/other sales	233.33 lbs	4,566.68	4.68	
7.	Bee sales		148,500.00	152.15	
8.	Bee/honey insurance receipts		1,170.00	1.20	
9.	Miscellaneous receipts		500.00	.51	
10.	Less: Honey purchase for resale		1,520.00	1.56	
11.	Hive rental - Pollination		.00	.00	
VALUE OF PRODUCTION			265,017.76	271.53	8.46
(B)					
1.	Bee purchases - Package Bees		42,811.00	43.86	
2.	Bee purchases - Queens		21,564.00	22.09	
3.	Bee purchases - Nucs		23,130.00	23.70	
4.	Freight and trucking		22,380.00	22.93	
5.	Sugar for feeding		20,260.00	20.76	
6.	Pollen supplement feeding		4,640.00	4.75	
7.	Medicine/Bee repellent		5,280.00	5.41	
8.	Bee/Honey insurance		12,814.00	13.13	
9.	Fuel		37,680.00	38.61	
10.	Repairs - Machine		10,140.00	10.39	
11.	Repairs - Buildings and improvements		5,420.00	5.55	
12.	Utilities and heating fuel		16,400.00	16.80	
13.	Custom work and machine rental		240.00	.25	
14.	Association dues, professional fees, promotion and travel		28,964.00	29.68	
15.	Small tools, supplies and miscellaneous expenses		15,924.00	16.32	
16.	Operating interest paid		300.00	.31	
17.	Paid labour and benefits	4,850.00 hours	91,220.00	93.46	
18.	Unpaid labour	2,474.00 hours	51,954.00	53.23	
VARIABLE COSTS			411,121.00	421.23	13.12
(C)					
1.	Land rent / lease, building rent and forage access		4,722.00	4.84	
2.	Taxes, licences and general insurance		18,570.00	19.03	
3.	Equipment and buildings	a) Depreciation	83,474.40	85.53	
		b) Lease Payments	.00	.00	
4.	Paid Capital Interest		31,200.00	31.97	
TOTAL CAPITAL COSTS			137,966	141	4.40
(D)	CASH COSTS	(B+C-B18-C3a)	413,659	424	13.20
(E)	TOTAL PRODUCTION COSTS	(B+C)	549,087	563	17.52
(F)	GROSS MARGIN	(A-D)	-148,641	-152	-4.74
	RETURN TO UNPAID LABOUR	(A-E+B18)	-232,116	-238	-7.41
	RETURN TO INVESTMENT	(A-E+C4)	-252,870	-259	-8.07
	RETURN TO EQUITY	(A-E)	-284,070	-291	-9.07

MANAGEMENT

Number of Hives	976
Average Yield per Hive (Lbs.)	32
Honey Produced (Lbs.)	31,334

TABLE 38: BEE SALES PRODUCTION ENTERPRISE INVESTMENT, 2022

INVESTMENT SUMMARY:	Total \$		\$/Hive
Land	65,500.00		67.11
Buildings	447,150.00		458.15
Bee equipment	471,230.00		482.82
Machinery	106,120.00		108.73
TOTAL INVESTMENT	1,090,000.00		1,116.80

INVESTMENT DETAIL:	Enterprise value (\$)	Age (years)	Depreciation (\$)
Land	65,500.00		
Honey house	214,000.00	10.60	10,700.00
Wintering shed	45,400.00	11.20	2,270.00
Houses (25%)	67,750.00	41.40	3,387.50
Other building	120,000.00	6.00	6,000.00
Buildings subtotal	447,150.00		22,357.50
Hives	287,300.00	5.60	33,039.50
Pallets	36,770.00	5.00	4,228.55
Forklift	54,000.00	7.00	4,320.00
Hive feeders	18,680.00	5.40	2,148.20
Super elevator	.00	.00	.00
Uncapping machines	4,000.00	4.80	320.00
Honey extractor	11,600.00	13.80	928.00
Dryer/heat exchanger	2,100.00	5.00	168.00
Wax spinner/separator	4,000.00	2.00	320.00
Honey tank and pipe	11,700.00	5.80	1,345.50
Feed tank	14,800.00	3.20	1,702.00
Storage vessel	.00	.00	.00
Boiler furnace	.00	.00	.00
Water system	.00	.00	.00
Compressor	1,100.00	2.40	88.00
Pressure washer	1,830.00	4.40	146.40
Fuel tank	.00	.00	.00
Scales	2,040.00	6.00	234.60
Barrels	4,740.00	1.20	545.10
Barrel loader	.00	.00	.00
Carts	1,058.00	2.80	121.67
Fencers / shockers	800.00	1.60	92.00
Shop tools	3,580.00	3.00	411.70
Staplers	652.00	3.80	74.98
Office equipment	.00	.00	.00
Lawn mower	3,280.00	2.20	262.40
Over-wintering insulation	7,200.00	2.40	828.00
Miscellaneous equipment	.00	.00	.00
Equipment subtotal	471,230.00		51,324.60
Trucks	68,100.00	10.48	.00
Tractors	.00	.00	4,344.30
Other machinery	38,020.00	5.11	9,792.30
TOTAL INVESTMENT	1,090,000.00		83,474.40