Bee Keeping

Lets Get Started.....



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So you want to be a beekeeper. That's great! We think the world would be better off if practically everyone kept bees! We also think that you should understand, as much as possible, what is involved.

Fiscal Management

Beekeeping is a seasonal activity in Manitoba. Although bees don't hibernate during winter they don't leave their hives and require their honey to survive. Making a budget will help with planning and make sure you have money to keep you and your bees with a home, food and healthy future.

How Much Does It Cost?

When nearly a thousand beekeepers what they wish they'd known prior to keeping bees, about 5% mentioned cost as one of the factors. A few said this was the best fun-to-cost hobby they'd had yet, but most who cited cost said it was more expensive than they had assumed.

Keep in mind that you could keep bees with no investment, other than hard work and skills for building what you need, and luck in capturing a swarm. Keeping bees with no initial cash outlay can happen, but rarely. For the majority of us, some purchases will be necessary.

Three Expense Groups when it comes to beekeeping

Initial Equipment Investment

Most of these expenses are an initial investment that will last for years, as would be golf clubs or a fishing boat if you're going to pursue those interests. What you'll need to invest in future years will decrease, unless you add more colonies of bees.

Housing

Each colony of bees requires its own living structure, called a hive. That investment is about \$200/hive. That price varies by hive type, quantity discounts, shipping expenses, and options.

Used housing? No. Unless you know why the equipment is available and how it was used, you may be slowly or quickly killing your honeybee investment by putting them in dangerous equipment. Used equipment may be carrying diseases that killed its previous occupants and left residues that live for years. The equipment, especially drawn wax, may also contain chemicals or a chemical build-up that will negatively impact your bees.

Hive Preparation

Beyond the hive, there are costs in hive preparation. The hive requires painting or something to protect it from the elements, and a hive stand and bottom board for bottom ventilation. The hive stand may be as simple as a couple of concrete blocks, to a manufactured hive stand. We'll estimate \$20/hive, although you may already have what you need for preparation.

Apiary Preparation

There may be additional costs in apiary preparation. Some of our surveyed beekeepers said this was where they spent unexpectedly. Once they fell in love with their bees they spent unplanned funds making a friendlier, more bee-supportive area, such as extensive landscaping to include bee-friendly plants, and even including a comfortable sitting area from which to watch the apiary.

Maintenance, Care and Location

When choosing a place for your hives keep the following in mind:



Time Management

It's important to learn when your peak season is and how to plan your activities around it. This manual includes a calendar that will help you stay on track, but you will always know your bees best!

How Much Time Does It Take?

If that's the question, most estimates range from 15–30 hours a year to tend one colony of bees. Of course, preparing the equipment the first year takes longer. Also, more hives equals more time, but the time/hive decreases a bit.

It's the same with beekeeping. You need to spend 15–30 hours that first year, but to learn to do it well takes time. You'll need to research, discuss and study both the bees and information on how to best manage them.

So, figure a minimum of 15-30 hours per hive that first year, knowing that as your interest in and desire to do it well grows, that may easily turn into a couple hundred hours a year counting time at bee meetings, talking with others, studying and researching, thinking about bees, and watching them.

Remember that marketing, administration and planning take time and not all your work-related activities will be directly managing your hives and products.

Physical Capacity

Bee keeping is a physically demanding trade. During summer flow season honey supers can weigh anywhere between 30-70 pounds!

Make sure you have the resources or community support to be able to visit the hive sites including maintenance, harvesting and production of products.

Maintenance

Bees need proper care and you need to look in on them at least once a week. You need someone to can be there when you are away.

Monthly Calendars

Here is an outline of annual treatments and hive changes with rough dates which will vary year to year:

Late March to Mid-April

- Check hives to estimate winter survival rate. Weaker hives are often lost in early spring when hive populations can be low.
- Some beekeepers will begin to feed in late March but unless the hives are very low on honey it is better to start feeding in late April.
- In the spring, the queen is stimulated better with a more nectar-like concentration of 1:1 sugar to water.
- In spring a hive might use 2 to 3 gallons of feed.
- Keep the hives wrapped in winter insulation until late April or early May.

May (busiest month for beekeepers)

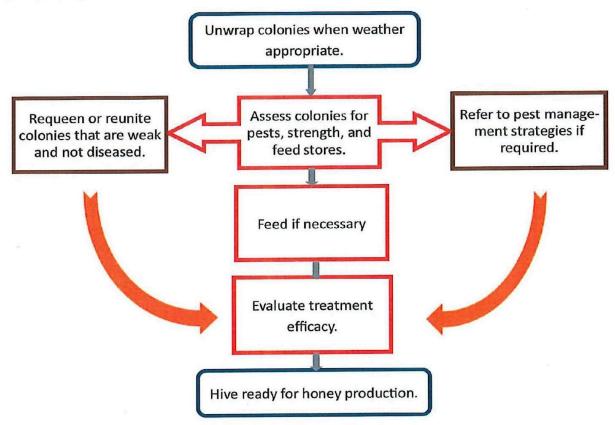
Early in the month:

- Clean bottom boards
- Remove winter wraps
- Apply medication
- Extra brood boxes may be given to the hives with large population

Last week in May (when dandelions are blooming):

- Best time to split the hives either using mated queens or letting them raise their own queens
- Weak hives may have problems with the queen and she may need to be replaced

Spring Management



June

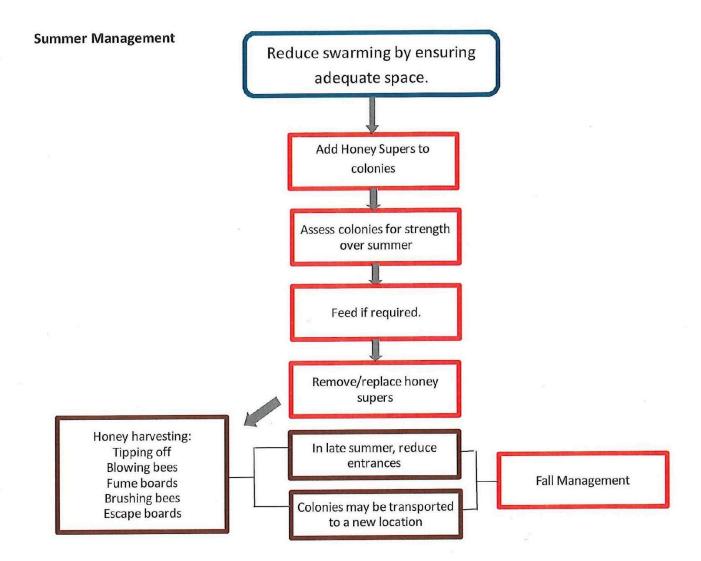
When the dandelions have finished, there are 2-3 weeks when not much nectar is coming in.

- Hives need to be fed sugar syrup during this time, especially since they are
 using a lot of resources to feed brood and build their populations. As soon as
 the frames begin to whiten with new wax, it is time to begin adding empty
 supers
- By the end of July most hives will have 3-5 honey supers placed above the brood boxes. Excluders may be used to restrict the queen to the brood chambers

July- August

The first removal of honey supers will usually take place the last week of July or first week in August.

- It is best to wait until the honey frames are at least 1/3 capped with wax. If they honey is not ripe (i.e. Contains too much moisture) it can ferment after it is extracted and put into containers, but this is rarely a problem in Manitoba
- Usually two empty boxes are put back on the hives as the full ones are taken off If these fill up, then more empty boxes can be added, or a second extraction of the honey can be made.



September

If the alfalfa bloom continues the bees can produce a significant amount of honey in the first half of September.

• The last and final extraction.

October

In late October or early November hives should be prepared with winter insulation. At some point when there is enough snow hives can be completely covered and this will greatly improve winter survival.

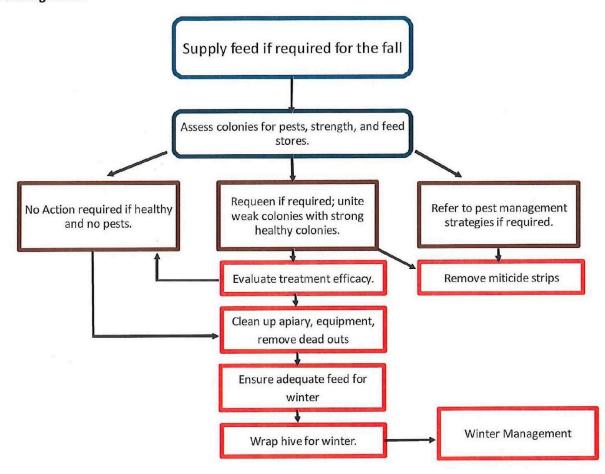
Once the hives are sealed they should remain undisturbed until April of the next year.

Cleaning and preparing for next season

September – Following the final harvest remove the last honey supers and excluder (if it is being used) and then apply antibiotic and mite control treatments.

- Feed the hives with sugar: water in a 2:1 ratio by eight (i.e. mix with 5gals (50lbs) of water is 100lbs (90kg) sugar) to prepare them for winter.
- Each hive will require approximately 5 gallons for fall feedings.

Fall Management





Introduction to Bees

European Honey Bees "Apris Mellifera" are the most commonly kept species of bee. They work together as a community to survive periods without food which is why honey is created and stored to act as a reserve. Bees are the only insect that store food in excess. Honey bee's gather nectar and pollen from flowering plants to create food. When they visit plants to gather food they pollinate it helping the plant survive and succeed. Pollination is very important to crop and wild plants.

Bee Anatomy

Honeybee have a four-stage life cycle:

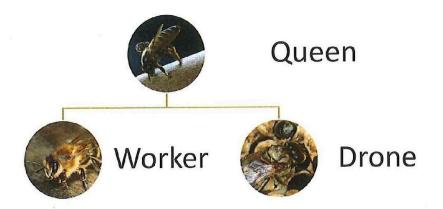


Development times can vary but generally it takes 16 days for queens, 21 days for workers and 24 days for drones to develop from egg to adult.

It takes approximently 3 days for an egg to hatch into larva where nurse bees then feed them around the clock.

After 5 days the larva are sealed into their cell by worker bees using beeswax. Once sealed they create a cocoon around their bodies and begin the transformation from pupa into adult bee.

When ready to emerge the new bee chews their way out of their cell to join the colony.



<u>Queen</u>

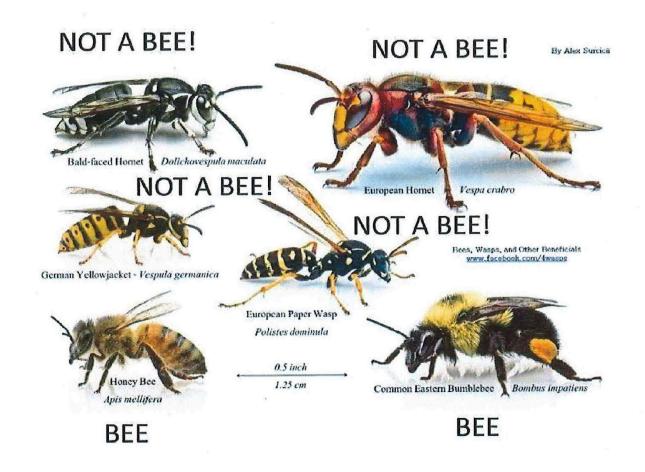
Each hive has one queen who is the only reproductive individual in the colony. She leaves the hive under two circumstances: as a virgin queen to mate, and in some cases, as an experienced queen with a swarm. On mating flights, the queen locates a "drone congregation area" to mate with up to 80 drones before returning to the hive. She will store all this sperm to use for the rest of her life.

Workers

Worker bees are sterile females who do all of the foraging, feeding of young, honey production and storage, wax production, cleaning, and defending the hive against intruders. Each worker bee will do a variety of jobs in her lifetime, which can last about 4-6 weeks.

Drones

The only male bees in the colony are drones. Their sole purpose is to spread the genetics of the colony by mating with virgin queens from other colonies. Once they mate, they die. Unsuccessful drones return to the hive to eat honey and pollen. Once swarm season is over, drones become a drain on resources inside the hive, and are driven out.



Bee Behaviours

Stinging

Bee's sting only as a last resort as stinging is lethal to the bee. Worker bees are the only ones capable of stinging.

Swarming

Is the process where a new colony is formed when the original queen and a large amount of the hive population leave. It is their natural means of reproduction and increasing the population.

This typically occurs during spring but can occur later in the year.

Swarming bees are typically docile since they do not have a hive, offspring or food to protect.

Diseases and Remedies

There are three main diseases that can be damaging to hives:

Disease	American Foulbrood (AFB)	Varroa mites	Nosema
Cause	Paenibacilus a bacterium that is specific to honey bees and creates spores. Highly contagious and lethal.	Parasites that attack both adults and the brood, with a distinct preference for drone brood.	Digestive tract disease in honeybees. It effects adult bees only and is highly infectious. The disease occurs primarily in late winter and early spring.
Symptoms	Spotty brood pattern, perforated sealed brood with coffee brown larvae inside, sunken sealed brood, coffee brown larvae sunken to the bottom of the cell. Larvae and pupae infected with AFB can exhibit a characteristic foul smell like dead fish (hence the name "foulbrood").	Losses due to these parasitic mites are often confused with causes such as winter mortality and queenlessness if the colonies are not examined for mites.	It increases the mortality of adult bees and the death of some colonies during winter, reduces honey yields, further causing poor population to build up because the bees are unable to produce enough royal jelly to feed the brood. If a queen becomes infected, her ovaries degenerate, and her egg laying capacity are reduced due to atrophy of the eggs.
Diagnosis	Touch a dead larva with a toothpick or twig. If sticky and "ropey" (drawn out) with a string of least 2 cm then your hive is infected with AFB.	Visible to naked eye	Microscope examination of infect tissues of bee.
Remedy	Terramycin Application	Apivar Strips applied to each hive in September as a preventative method. Also, can be used in early spring if mites are present then.	Preventative treatments using the medication Fumagillin are applied annually by some bee keepers.

Operating Equipment
There are lots of options for beekeeping equipment. Make sure to review all the information as it can be a big investment and you'll be using your tools regularly. Here is a list of standard tools used by beekeepers and a list of where to source it.



Hive Tool



Bee Brush



Smoker



Safety Footwear





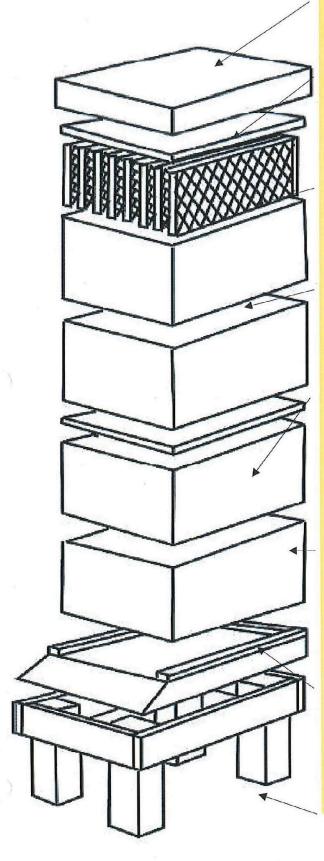


Veil



Gloves

The Hive



Top Cover

Protects the hive from the elements.

Inner Cover

Lifts the top cover and adds ventilation and insultation with air

<u>Frames</u>

Where the honey or brood is made. Most commonly made of wood with a foundation of wax.

Honey Supers

Different sizes allow for different production rates, but smaller ones are generally easier to handle.

Queen Excluder

Keeps the queen in the brood boxes.

Mainly used when hives have a single brood box.

Considered optional by many keepers.

Brood Boxes / Hive Body

Where the bees live year-round.

This is where bees are raised.

Pollen is stored here to feed the larvae.

Entrance Block (not shown)

Narrows the entrance to the hive to keep in heat and increase security of the hive.

Bottom Board

The floor of the hive.

Hive Stand

Keeps the hive away from pests and elements.

Getting Your Bees

Purchasing Options

Honeybees are typically purchased in one of two ways, a package, or a nuc.

Queens, accompanied by five to six attendants are typically shipped in queen cages and plugged with queen candy

A package is generally three pounds of bees, with a separately caged queen, all in a screened box. The package bees must be moved into a hive. Package bees are used to establish new colonies and replace winter losses. Packages usually weigh 1 or 1.5 kg (kilograms) and contain 8000 or 12,000 bees. Bees are shipped in either wooden or screened boxes with a sugar syrup feed source or in tubular containers with a gelled feeding source

Nucleus colonies or nucs consist of a smaller number of bees than a full-sized colony and usually include a queen, brood, honey, and pollen. Bees are shipped on comb in nucleus hives smaller boxes with fewer frames than standard hives. A nuc is a small nucleus colony, containing typically 3-7 frames, bees already drawing comb and tending to eggs and larva, and a freed queen working to expand the colony, all in a small hive-like box. A nuc can remain in the small box for a bit.

A full-sized colony is a complete unit, comprising a standard-sized hive box, frames with combs containing honey, pollen and brood, the queen and worker honey bees.

One-time Investment?

Hopefully you need to buy bees only once. However, honeybees succumb to plenty these days—Varroa mite infestations, small hive beetle (SHB) infestations, hard winters, wet springs, dry summers, Colony Collapse Disorder (CCD), expect to lose at least some if not all of your bees on any given year.

Hints

- Where available, purchase locally produced queens and nucs of known health status from certified or inspected suppliers or cooperatives. Consult supplier lists that are issued annually by some provincial apiarists or other honey bee regulating authority.
- Purchase bees from suppliers that you know and trust and those with established disease/pest management programs.
- Investigate unfamiliar suppliers before purchasing.
- Produce, or purchase queens and nucs from bee breeders that offer bee stock with desirable genetic traits.
- Re-queen on a regular basis, ideally every one to two years, with young queens to promote healthy bees.
- When bees are purchased from out of the province, obtain confirmation that the inspection by the designated originating authority was conducted as specified in the provincial and federal regulations before entry into the province

Record Keeping

What Do I Not Want to Record?

- Don't care about ants
- Don't care about brace comb.
- Don't care about equipment. If it needs replacement, a note goes on the action list.
- Don't care if there's pollen on frame 2 or 3, or capped brood on frames 4, 5, and 6. Just care that they have enough of both.

What Do I Want to Record?

- Date of package installation, or date of nucleus colony establishment.
- Date you caught and hived a swarm.
- Dates of inspections and notable sightings: Where was the queen? What did the brood pattern look like? Anything concerning to note?
- Dates and methods of treatments, if applicable.
- Number of pests and populations of varroa mites (with date of inspection, of course).
- Date of honey harvest and amount collected (always note how much and what varieties came from which hives).
- Quick to-do list after an inspection. (It's always easier to remember what you need to do after you've just finished not doing it.)
- Follow-up inspection results.
- List of equipment to buy, notes of replacement parts, or items that need repairing.

What's Available?

There are many packaged recordkeeping systems to choose from, from very simple to very sophisticated.

The most important thing is to choose something that works for YOUR style of management and YOUR particular operation. It makes sense to spend a little time thinking about what you want to record and how you'd like to do it.

Paper & Pen Systems

Advantages

- Economical
- Good choice if you have a small number of hives
- Compact and portable

Disadvantages

- Tedious to pull out specific data if organized in journal format
- Doesn't fare well if you forget it in the beeyard and it rains!
- Becomes cumbersome with larger numbers of hives, especially when moving bees

Digital Systems

Advantages

- Can readily sort and manipulate data
- Fast keyboard entry if you are a good typist
- Can back up data so all is not lost if something happens to the device
- Essentially unlimited storage space no need to buy more notebooks!

Disadvantages

- Expensive equipment
- Some need an internet connection, which, if you have multiple apiaries, may not be available without additional expense
- Propolis and honey on your hands do not benefit most digital equipment! This may result in double entries (field notes transcribed to computer)

Copies of records, including invoices, hive identification systems, and permits for imported bees should be kept for at least one year to enable traceback.

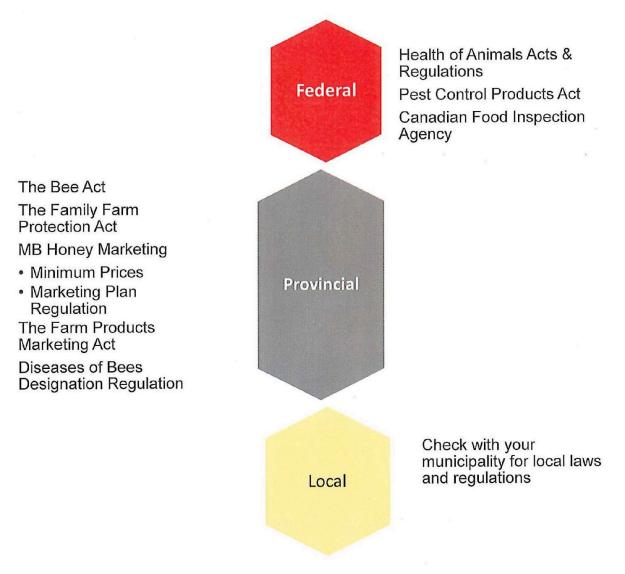
Business of Bees

Laws & Regulations

It's important to follow the laws and regulations which were designed with safety and sustainability in mind.

In Manitoba you are required to register your hives with Government of Manitoba.

There are other laws and regulations you should be familiar with which are listed below:



Outside of NACC consider joining other beekeepers for support:

Red River Apiarists' Association (beekeepingmanitoba.com) Manitoba Beekeeper's Association (manitobabee.org/hive) Bee Maid Honey (beemaid.com)

Business Management

Owning a small business can be a rewarding experience. It's important that you follow laws, regulations and best practices for bee keeping and business.

Connecting with local business mentors, resources and bee community will help you understand your business better and improve your chances of success.

A key resource for all business owners is a *business plan*. A business plan is your roadmap to success and can be tailored to fit your needs. We've provided you with a template for a one-page business plan which is commonly referred to as a lean business plan on the next page.

Here are some resources for small businesses' in Manitoba:

- Entrepreneurship Manitoba
- Community Futures
- Women's Enterprise Centre of Manitoba
- Louis Riel Capital Corporation
- First Peoples Economic Growth Fund

Business Plan Template

Company Name:	
Address:	
Contact Information:	
Date:	
Mission:	Income Streams:
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	2.
	3.
	4
	5. 6.
	Future Income Streams:
	1.
Business Goals:	2.
1.	
2.	
3.	
4 5	
6.	
	Expenses:
	1.
Business Strategies / Objectives:	2.
1,	3.
2.	
3.	5.
4.	6
5.	
6	8
	9
Total Yearly Budget:	10
Income Projection & Explanation:	
	4
	Personal Credentials:
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Cost Projection & Explanation:	
the state of the s	Personal Growth Goals:
	1
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	5.
	6

How to Complete a 1– Page Business Plan

Mission

This is what you ultimately want to achieve through for your business.

Business Goals

Include your business goals.

Business Strategies / Objectives

Your action plans for achieving your goals.

Total Yearly Budget

Estimate what you can realistically spend through a total budget.

Income Projection & Explanation

Estimate your income for your first year and explain how you got to that estimate.

Cost Projection & Explanation

Estimate your expenses (yearly or monthly).

Consider everything and DO NOT underestimate your costs.

Income Streams

List all your starting or existing income streams. List each on a separate line.

Future Income Streams

List all future income streams you plan to, or would like to, add.

Expenses

Here's where you'll list the expenses you can reasonably expect to incur.

Credentials

List your current credentials you have related to your specialty area.

Personal Growth Goals

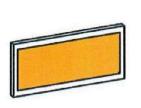
List the actions you can take to build further credentials.

Bee Products

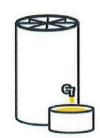
There is more to beehives than just honey.



Steps to Honey Production











- 1. Honey supers are removed from hive and brought to a secure location typically referred to as a "Honey Hut". The hut is a sterile location where honey processing happens.
- 2. The honey caps are removed by hand with a tool or sometimes a special machine for decapping.
- 3. Frames are put in a centrifuge which spins the frames very quickly and drains the honey out of the shells. It leaves the wax and cells behind and the honey drains to the bottom.
- 4. Honey is then put in an initial storage container to allow debris to raise to the surface where it is skimmed and removed from the final honey product.
- 5. Honey is packaged and labeled and prepared for sale.

Honey Pricing

TO PRODUCE

Beekeepers who managed from 5 to 99 hives were surveyed. On average each beekeeper operated 44 hives and their average yield was 169 pounds per hive. The total value of production was estimated at \$19,157 per beekeeping operation or \$438 per hive or \$2.59 per pound of honey produced. Average variable costs for beekeepers with less than 100 hives was estimated at \$10,189 or \$233 per hive (\$1.38 per pound of honey produced).

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

TO SELL

2018 Recommended Honey House Price - Manitoba Association of Beekeepers

\$3.50 per pound \$7.70 per kilogram

Recommended Price for Farm Gate Honey sold in Producer Supplied Container.

Floral Specific or Specialty Honey may be at a premium above the recommended base rate. *Honey sold in specialized containers may be at a premium.*

The <u>minimum</u> prices at which Grade Canada No. 1 White honey may be sold by producers or associations of producers in the Province of Manitoba are fixed at the following prices:

Sizes	Unit Price	Case Quantity	Case Price
500 g	\$1.21	24	\$29.04
750 g	\$1.82	12	\$21.84
1 kg	\$2.30	12	\$27.60
1.5 kg	\$3.45	6	\$20.70

With proper management, a hive can turn a profit relatively quickly, especially if the beekeeper is willing to consider all the potential streams of revenue. It may be an unusual animal business idea, but beekeeping is certainly something to consider for aspiring animal professionals

One hive can produce 60 lb (27 kg) or more in a good season, however an average hive would be around 25 lb (11 kg) surplus. Bees fly about 55,000 miles to make just one pound of honey, that's 2.2 times around the world

Honey Labels

Canadian Law requires the following on labels:

Common Name: "Honey" alone or with name of blossom (i.e. Alfalfa Honey)

Brand/Trade Name:

<u>List of Ingredients:</u> For single ingredient foods like pure honey the common name can be considered the list of ingredients

Net Quantity:

Standard Container Sizes: Any weight up to and including 150g, 250g, 375 g, 500g, 750g, 1kg, 1.5kg, 2kg, 3 kg or 5kg.

Honey Packaged in bulk: 7kg, 15kg, 30kg, Containers less than 30kg, multiples of 1kg

Identity and Place of Business:

Consumer: On the label

Bulk: Must be on the container

Country of Origin: "Product of Canada"

Grade & Colour Class Designation:

Canadian N. 1, N.2, No. 3 or substandard

This classing system can't be used unless the honey is prepared in an establishment registered with Canadian Food Inspection Agency.

Type Height for Net Quantity

Number of Containers within Bulk Container

Lot Number

<u>Liquid Creamed or Pasteurized</u>

Honey and Bees – the Statistics

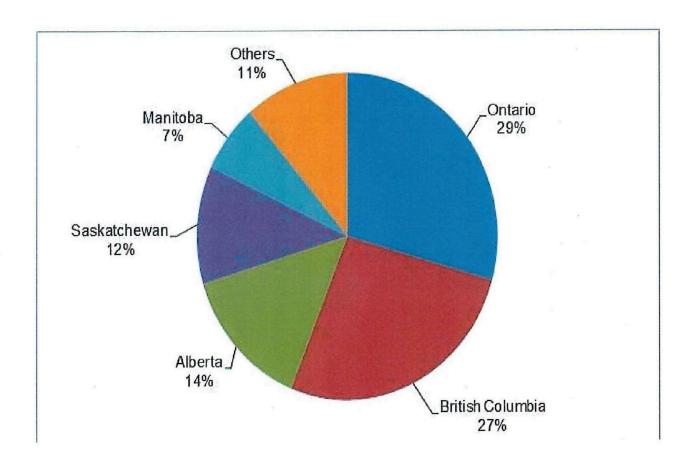


Figure 1 - Honey Production In Canada

Appendices

Canadian Beekeepers' Practical Handbook to Bee Biosecurity and Food Safety Canadian Honey Council, 2017

Legislation

Health of Animals Act
Consumer Packing and Labelling Regulations
Family Farm Protection Act
The Farm Products Marketing Act
Pest Control Products Act
Economics of Beekeeping in Alberta 2016

Forms

Bee Log Book

References

NACC Bee Program Manual

General Beekeeping Schedule and Information – Bruce McLean Western Sky Apiaries

CBISQT Producer Manual

Canadian Beekeeper's Practical Handbook

The Bee Act

The Family Farm Protection Act

MB Honey Marketing Board Minimum Prices

MB Honey Marketing Plan Regulation

Diseases of Bees Designation Regulation

Honey Producers Admin Fee Regulation

Honey Bee Producer Guide to the National Bee Farm-level Biosecurity Standard -

Animals - Canadian Food Inspection Agency

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