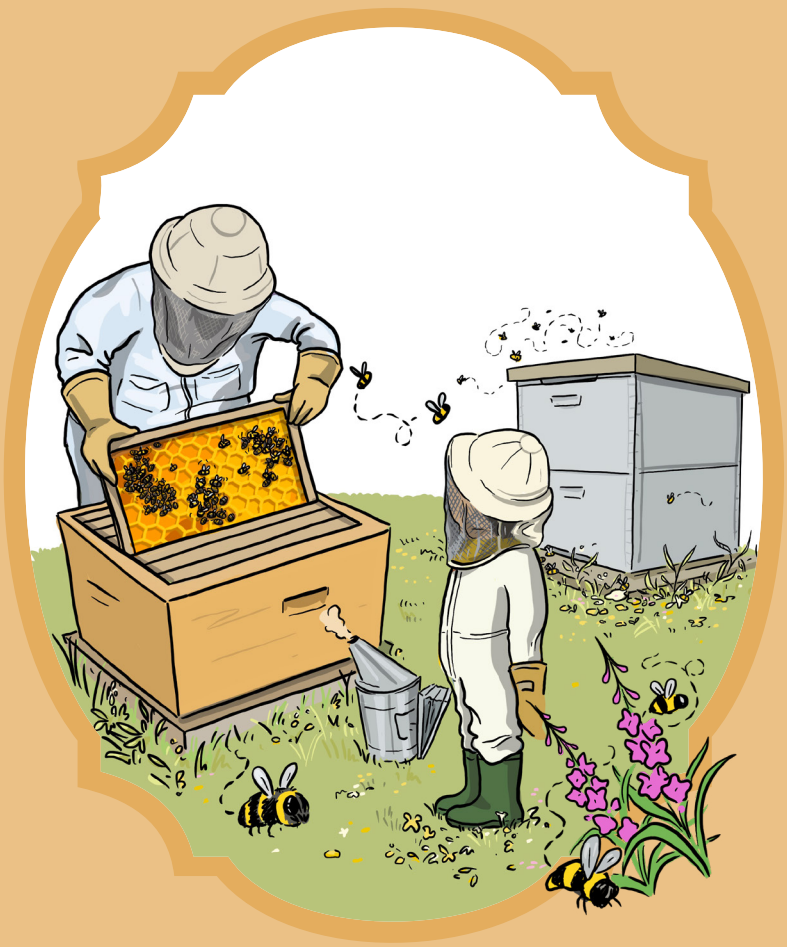

NORTHERN BACKYARD FARMING

BEEKEEPING

6

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BEEKEEPING

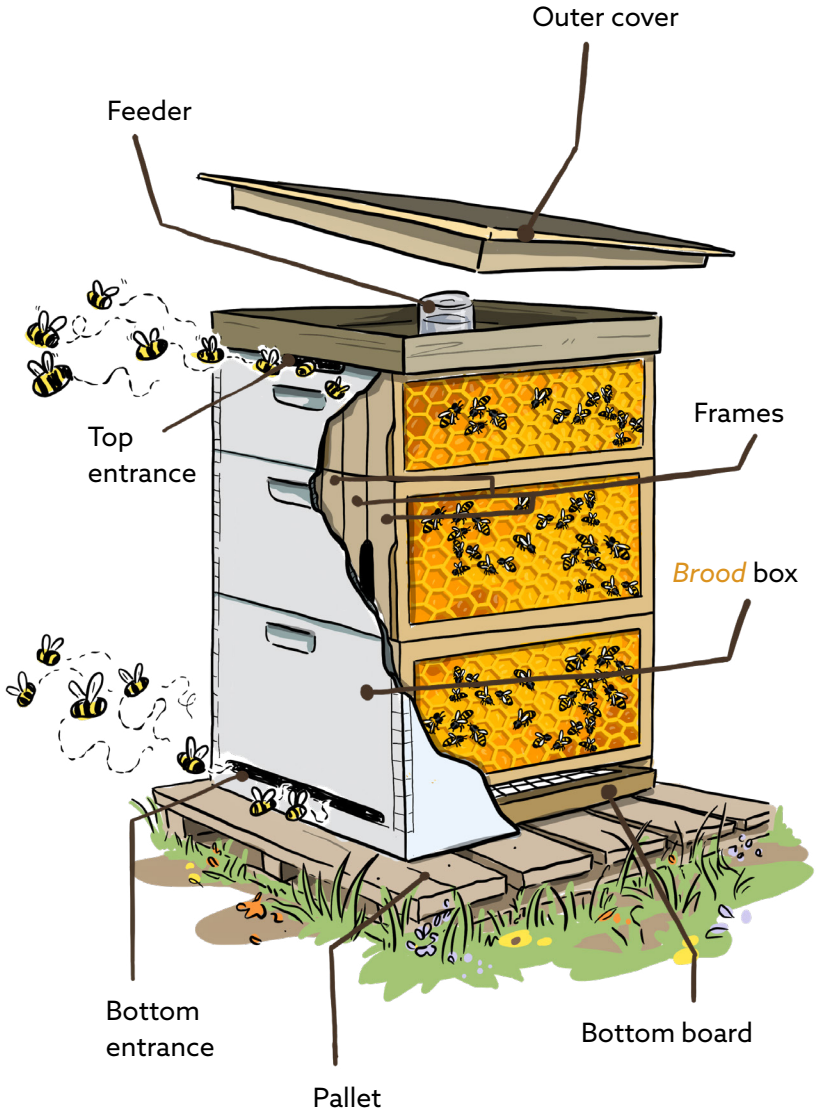
Beekeeping Basics

To bee, or not to bee?

Beekeeping has been a part of human history for thousands of years, but is still relatively new in the Northwest Territories. This document will introduce you to the information you need to get started in beekeeping, and highlights some ways northern beekeepers have adapted to the harsh northern climate.

Beekeeping is not to be taken-on lightly, it comes with a considerable time commitment and financial responsibility. Consider environmental conditions and whether you have the space and adequate floral resources near you to support your colony. Consider costs of equipment and of the bees themselves.

Beehives need to be inspected regularly and require feeding in the spring and in the fall. You can expect to spend large portions of your weekends and evenings cleaning equipment, inspecting hives, and preparing them for the long winter months. That being said, bees are fascinating social animals, and fun additions to a backyard.



Honey bee hierarchy

Honey bees are social creatures that have a highly organized community structure. Each bee has a job to do in the bee colony!

The Queen: She is tasked with laying eggs and will only leave the hive to mate or to swarm. Queens lay unfertilized eggs to produce males, and fertilized eggs to produce workers (infertile females). There is one queen in the colony at a time.

Workers: Infertile females that oversee all aspects of the hive. The worker bee's tasks include cleaning cells, rearing young bees, building comb, guarding the hive, and foraging for nectar, pollen, and water.

Drones: The males in the colony, they exist exclusively to mate with a queen. Drones make up a relatively small percentage of the bee colony's total population. Queens lay drone eggs in case an old queen dies, or in preparation for swarming. Drones are forced out of the hive in the fall, to conserve honey for the winter months.

Which bee is best for me?

Honeybees vary in traits such as temperament, disease resistance, tolerance to cold, and productivity.

Common types of honey bees in North America:

The Italian Bee: docile, excellent honey producers. Drawback: tendency to rob honey from neighbouring hives, do not perform well in colder climates.

The Carniolan Bee: Quick population build-up in the spring, very docile, good builders of wax *comb*, one of the best for overwintering. Drawback: tendency to *swarm* if overcrowded.

The Russian Bee: Great disease resistance, accustomed to cold climates, population able to adjust based on each season's resource availability. Drawback: slightly more aggressive.

The Buckfast Bee: Resistant to tracheal mites, do well in colder climates, docile, excellent honey producers, low tendency to swarm.

Nutrition

Quit pollen my leg

Just like humans, honey bees need a diverse diet that includes carbohydrates, vitamins, minerals, fats, proteins, and amino acids for proper development. They acquire these nutrients from nectar and pollen.

Nectar is the primary source of carbohydrates. Bees process nectar into honey.

Pollen is the primary source of protein, fats, vitamins, and minerals

Water is essential to maintain constant temperature and humidity within the hive.

Royal jelly is rich in vitamins, proteins, and amino acids. It is produced from the glands of worker bees and given to all bees for the first two days of life. Queen bees are created when female bees are fed royal jelly throughout their development.

Supplemental feeding

You can provide your bees with supplemental feed throughout the summer if you wish.

Supplemental feeding is used to maintain colony health and development when food stores are scarce, this is especially important in the north due to the short summer foraging season. The most common forms of supplemental feed are sugar syrup, *fondant* (candy board), and *pollen patties*.

Pollen patties and a ratio of 1:1 sugar to water is best in the early spring.

A ratio of 2:1 sugar to water is best in the fall.

Feeding methods

Inverted hive-top feeders: A shallow box that holds a reservoir with several gallons of sugar syrup. The bees access the feed through a screened bottom. The feeder sits on top of the uppermost *super*.

Re-sealable plastic bag: A simple, cost-effective method that involves filling a 1-gallon perforated re-sealable bag with sugar syrup, placed on top of uppermost super.

Boardman feeders (or entrance feeder): An upside-down jar filled with sugar syrup that rests on a specialized base allowing bees' access to the syrup. It is joined to the hive entrance.

Open feeding: Involves leaving sugar syrup out in the open so the bees can access it as needed. This method entices *robbing* from neighbouring hives.

Frame feeder: This feeder replaces a frame within the hive. It is a deep reservoir that can be filled with sugar syrup.

Overwintering

Beelieve you can do it

The biggest challenge for northern beekeepers is the long, cold winter season. It may take multiple attempts before being able to successfully overwinter a colony.

Proper ventilation is crucial for removing CO_2 and moisture!

Bees overwinter best between 5°C-10°C. Above 10°C, bees may break dormancy and consume more food and starve to death. Below 5°C, the bees may freeze.

Avoid the urge to check on your bees over the winter. An intruder will excite the bees and encourage them to feed on their winter reserves more quickly.

Indoors vs. outdoors

Bees can be overwintered indoors or outdoors. In both cases, remember to ensure that there is plenty of ventilation through hive entrances and that the hives are kept off the ground.

Talk to experienced beekeepers in your region to learn tips and tricks to help overwinter your hives.

Overwintering in an insulated shed:

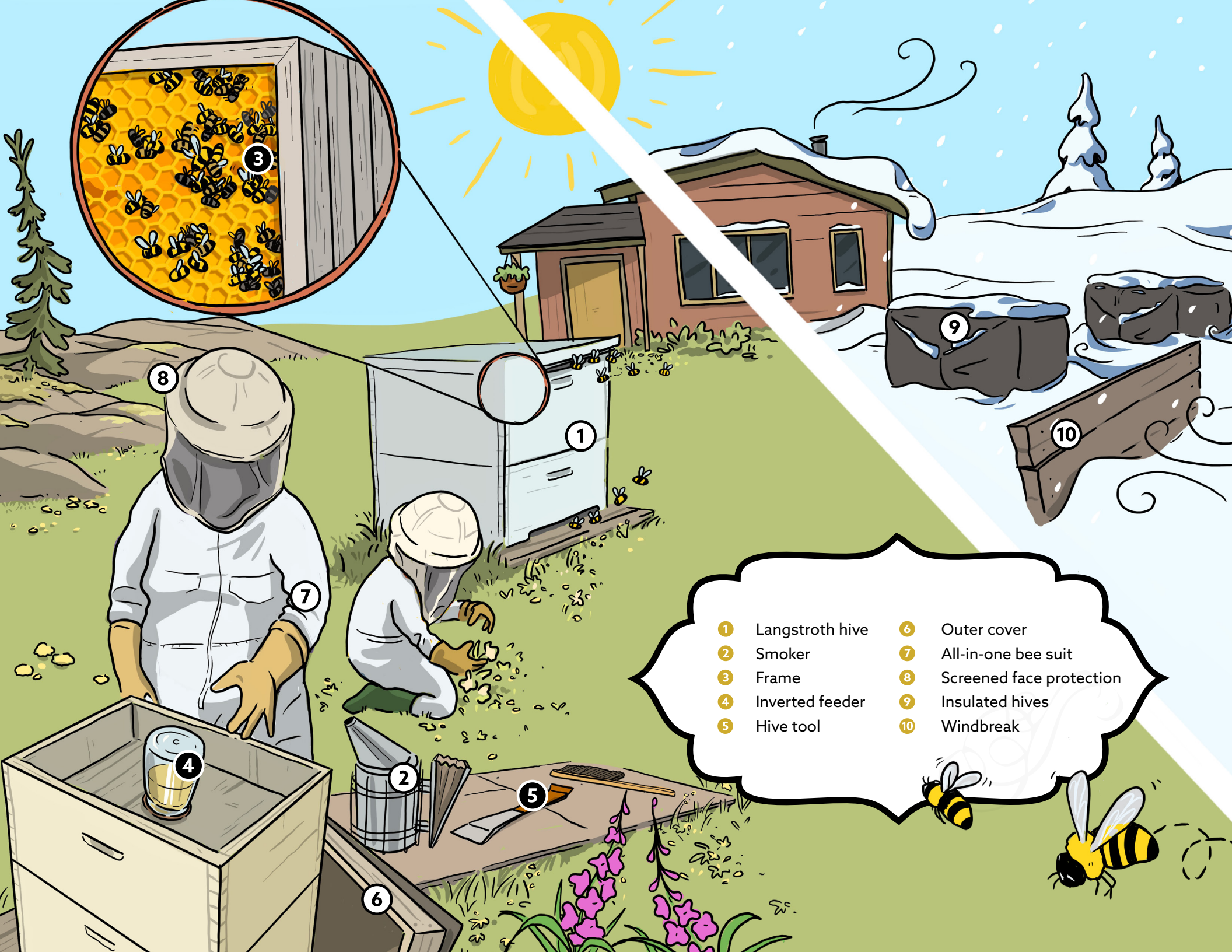
- Install exhaust fan or louvre in shed
- Wrap hives in R-12 insulation
- Humidity should be kept between 50-60%

Overwintering outdoors::

- Take hive surroundings into account
- Shelter hives from wind
- Wrap hives in R-30 to R-40 insulation
- Black felt, plastic, or tar paper will help absorb heat from the sun
- Snow has great insulating potential

Stronger together

During winter months, worker bees will cluster in a ball around the queen and vibrate to generate heat. A large population has a better chance of surviving the season.

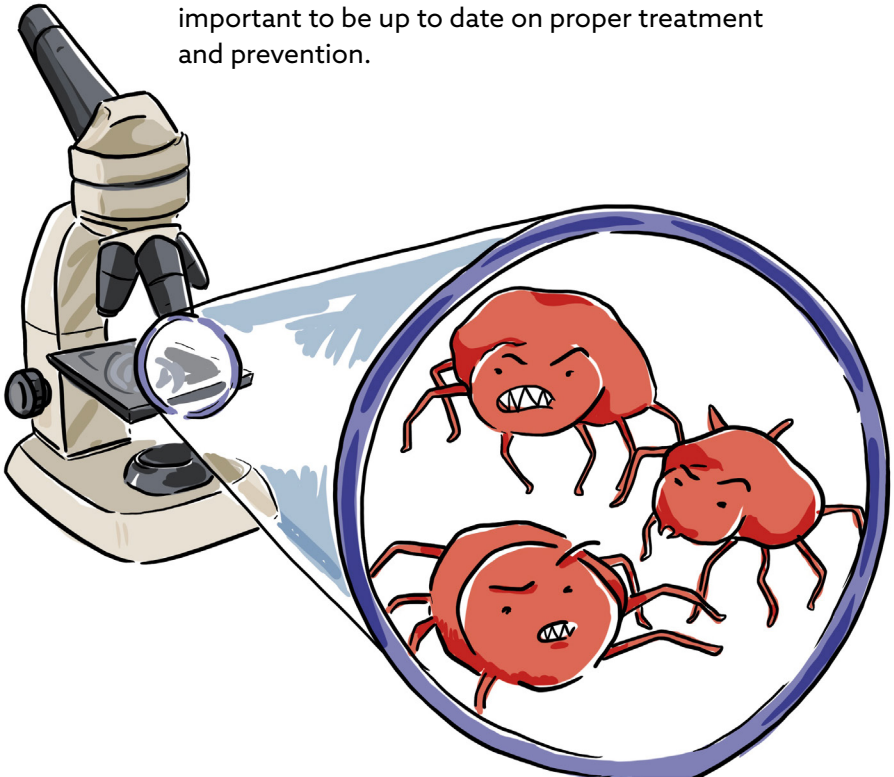

1 Langstroth hive
2 Smoker
3 Frame
4 Inverted feeder
5 Hive tool
6 Outer cover
7 All-in-one bee suit
8 Screened face protection
9 Insulated hives
10 Windbreak

Diseases and Pests

It bee like that sometimes

Many diseases, viruses, bacteria, and fungal infections can affect honey bees and can potentially spillover and harm native bees. Protecting honey bee colonies from disease and pests is a critical component of best management practices.

The most significant pests and diseases of the honey bee in Canada are Varroa mite, American foulbrood, Nosema disease, and chalkbrood. They all have the ability to cause colony loss. It is important to be up to date on proper treatment and prevention.



There mite be something foul...

American foulbrood (AFB): Bacterial infection that affects bee larvae. Considered one of the most contagious and detrimental diseases. It remains viable in beekeeping equipment for many years and is resistant to most disinfectants and heat. Look for a strong fish-like odour and dead larvae.

Varroa Mites: Feed on bee blood and body fat of pupae , and damage developing bees. They transmit many viruses, causing a variety of diseases and deformities. Mites are visible to the naked eye and have a reddish-brown body.

Nosema: A parasite infecting adult honey bee's gastrointestinal system, limiting their ability to digest their food. Infection spreads rapidly from bee to bee, especially when enclosed during overwintering. Look for fecal deposits inside the hive and at the entrance of the hive.

Chalkbrood: A fungal disease that infects honey bee larvae and sometimes pupae. It can be more common in northern climates due to high moisture in early spring. Look for black, grey, or white *mummied* bee larvae, and pinholes on *cappings*.

Harvesting

Show me the honey!

With hard work (and patience) from both the beekeeper and the bees, honey and comb can be extracted from the hives. These can be used to make an assortment of products, such as beeswax candles, body butters, soaps, salves, and ointments. Honey is great on it's own, of course!

Honey extracting tips:

- Do not extract honey from brood chambers
- Use stainless steel equipment
- Ensure bees have enough honey to survive
- Only harvest from strong, healthy colonies
- An *uncapping tool* will make extraction easier
- A *honey extractor* will simplify the process

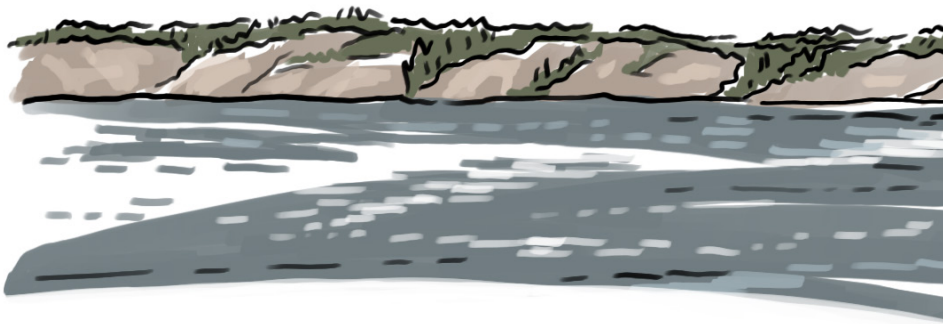
At least 90 pounds of honey stores are needed to get a hive through winter.

Responsible Beekeeping

It's the way to bee

Some of the most significant threats to native bees are climate change, pesticide use, habitat degradation, and the introduction of pests and diseases from imported bees. When it comes to bee conservation, individuals, communities, and beekeepers in the NWT have an important role to play in ensuring the future of native bees in our environment and around the world.

It is also important to recognize that high-density beekeeping is a threat to native bees, as they will compete for resources. Before attempting beekeeping, consider how many honey bee apiaries are already present in your area and acknowledge that starting another operation may be detrimental to the native bee population, or even your own operation. Consider joining a bee co-operative with a neighbour to reduce single apiary operations.



NWT bees

We beelong together

There are 110 native bee species in the NWT, including bumble bees, mason bees, leafcutter bees, and more. Honey bees, the subject of this guide, are not native to the NWT.

Native bees are important pollinators for many plant species and are present in all regions of the NWT. Bees have been collected as far north as Banks Island! Unfourtunately, three bumble bee species are currently considered to be at-risk in the NWT:

Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*)

Western Bumble Bee (*Bombus occidentalis mckayi*)

Yellow-Banded Bumble Bee (*Bombus terricola*)

Bee a scientist

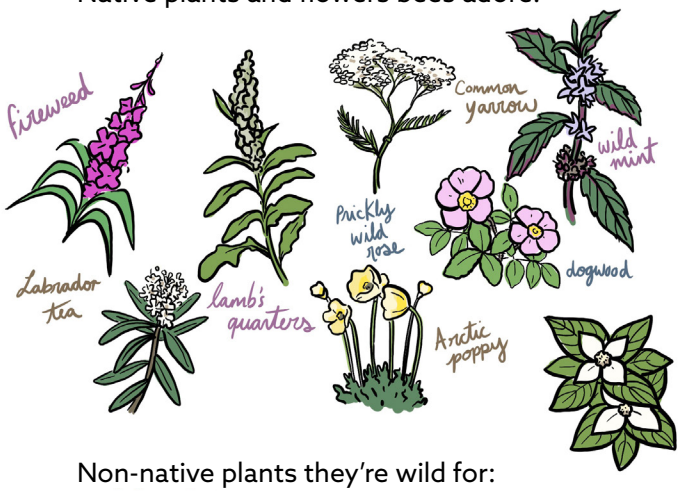
Share your bee photos to iNaturalist.ca or to the NWT Species facebook page!

One way to help native bees is to participate in citizen science. When out in nature, document bee observations through photographs and notes. Capture traits of bee species in the area (e.g. size, colour, shape etc.), record observations of their behaviour and the plants they visit. This is important data to help us better understand and foster native bee populations.

Won't you bee mine?

One way to support native bee species is by planting their favourite plants and flowers!

Native plants and flowers bees adore:



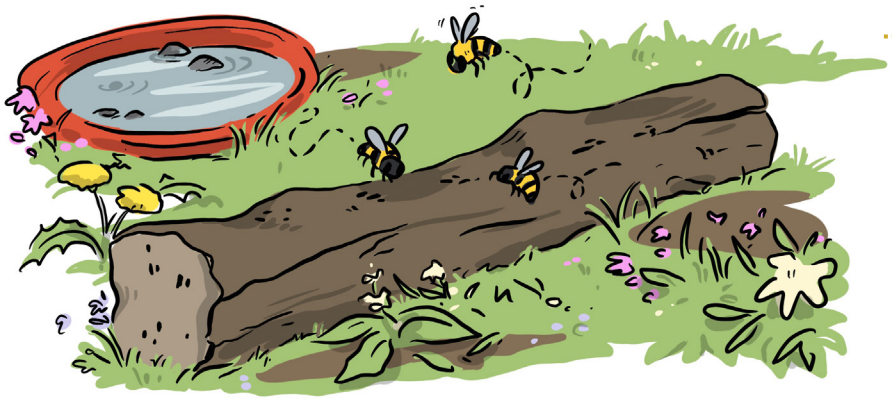
Non-native plants they're wild for:

Caring for native species

Many native bees nest in dead tree branches, soil, leaf debris and on the forest floor.

One of the best ways to look after local bee species it to give them environments they can call home, and not disturb areas they might be nesting in.

- Provide a clean water source in your yard
- Build a bee home
- Avoid disturbing places bees may live
- Don't use pesticides, herbicides, or fungicides



Glossary

Brood: The eggs, larvae and pupae of bees.

Capping: A thin layer of new wax that bees build over the top of honey and brood.

Comb: Hexagonal, thin-walled cells constructed from beeswax by bees to hold honey and larvae.

Fondant: A solid mixture of sugar and a small amoutn of water that can be fed to bees in the winter months.

Honey Extractor: A mechanical device used in the extraction of honey from honeycombs using centrifugal force. A drum or container holds a frame basket which spins, flinging the honey out.

Mummied: A larva that transitions from a white to grey-black colour when infected.

Ocelli: Special eyes that bees use to orientate themselves towards the sun.

Pollen Patty: A pollen substitute made out of a variety of different ingredients, usually fed to bees in the spring.

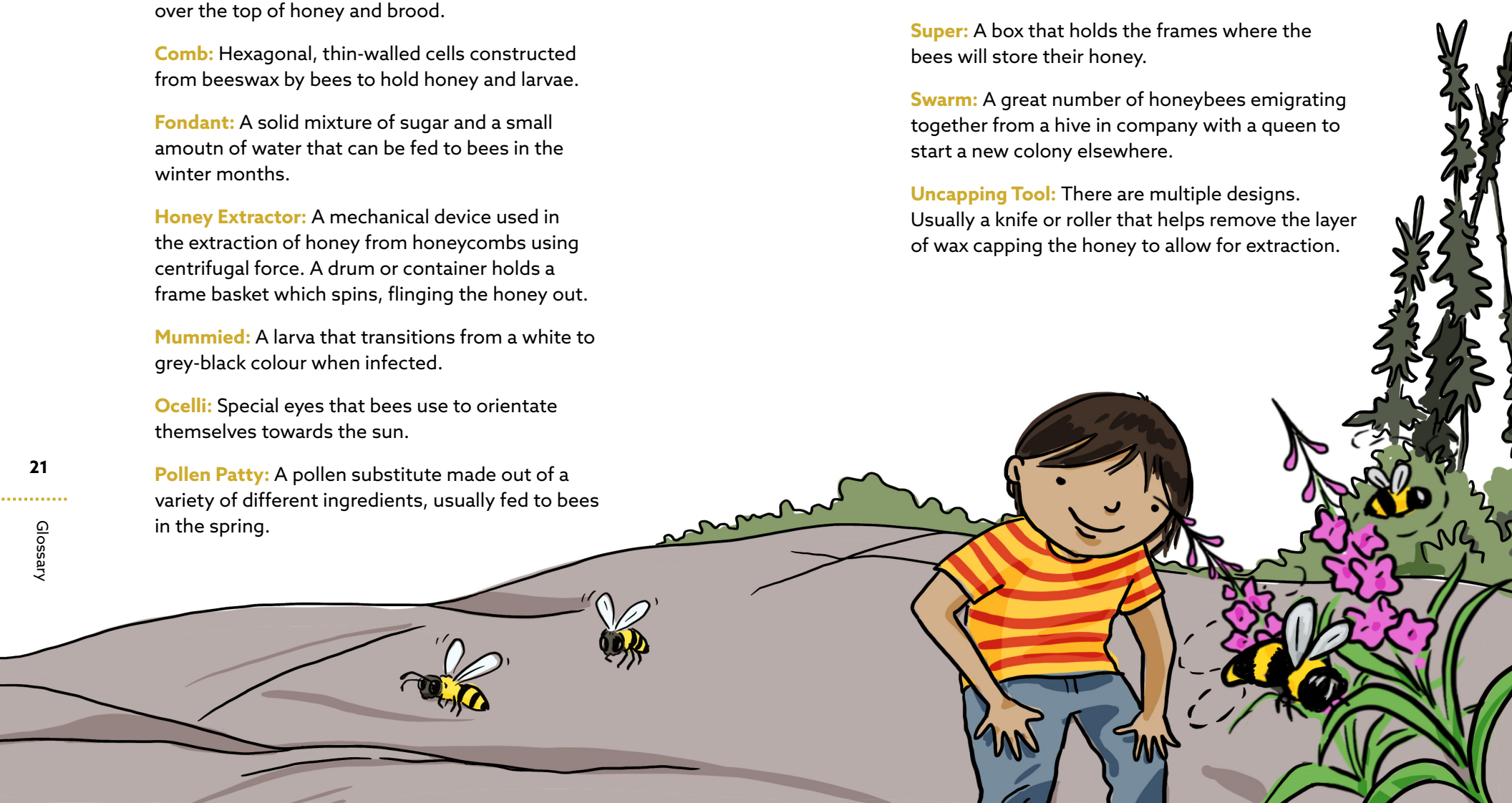
Robbing: Term used to describe honey bees that are invading another hive and stealing the stored honey.

Spiracle: Respiratory openings used for breathing. The spiracles branch to the bee's organs.

Super: A box that holds the frames where the bees will store their honey.

Swarm: A great number of honeybees emigrating together from a hive in company with a queen to start a new colony elsewhere.

Uncapping Tool: There are multiple designs. Usually a knife or roller that helps remove the layer of wax capping the honey to allow for extraction.



Resources

Web resources

Insects and Spiders - "Bees"
www.enr.gov.nt.ca/en/services/insects-and-spiders
Field Guide to bumble bees in the NWT and the Photographic Keys and Atlas for bees of the NWT.

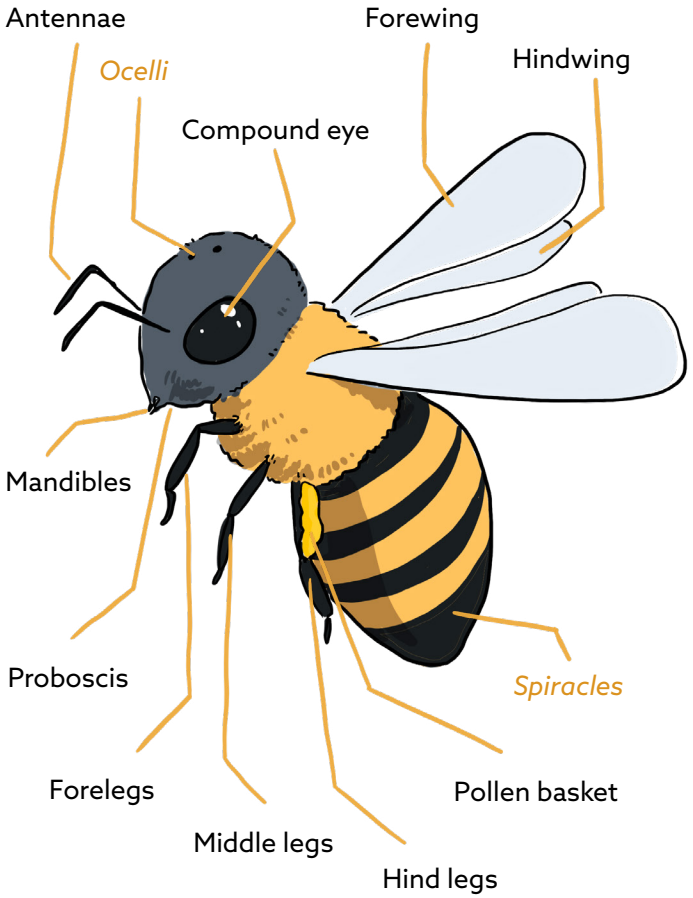
Bees and Apiculture
www.alberta.ca/bees-and-apiculture.aspx
Regulations, research and resources for beekeepers in Alberta.

Canadian Beekeepers' Practical Handbook to Bee Biosecurity and Food Safety
https://honeycouncil.ca/canadian-beekeepers-practical-handbook-to-bee-biosecurity-and-food-safety/
A handbook with record keeping templates and tools to help all beekepers maintain biosecure and food safe operations.

Northwest Territories Beekeeping Best Management Practices
https://ecologynorth.ca/project/beekeeping-best-management-practices/
A best management practices guide to bee husbandry in the north.

Bee Anatomy

What's the buzz?



About this book

Sorting through documents and research on beekeeping is often overwhelming, confusing, and not adapted to northern climates. This guide is intended to illustrate the basics of backyard beekeeping in the Northwest Territories. Beekeeping is fun and requires minimal space. It can also be challenging. With a bit of patience and a lot of hard work, you can reap a sweet reward.

This guide also emphasizes our responsibility to nurture our native bee species and the steps we can all take to reduce threats to their health.

For additional books in the series or for more information, please contact Ecology North.
(867) 873-6019 www.ecologynorth.ca.

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