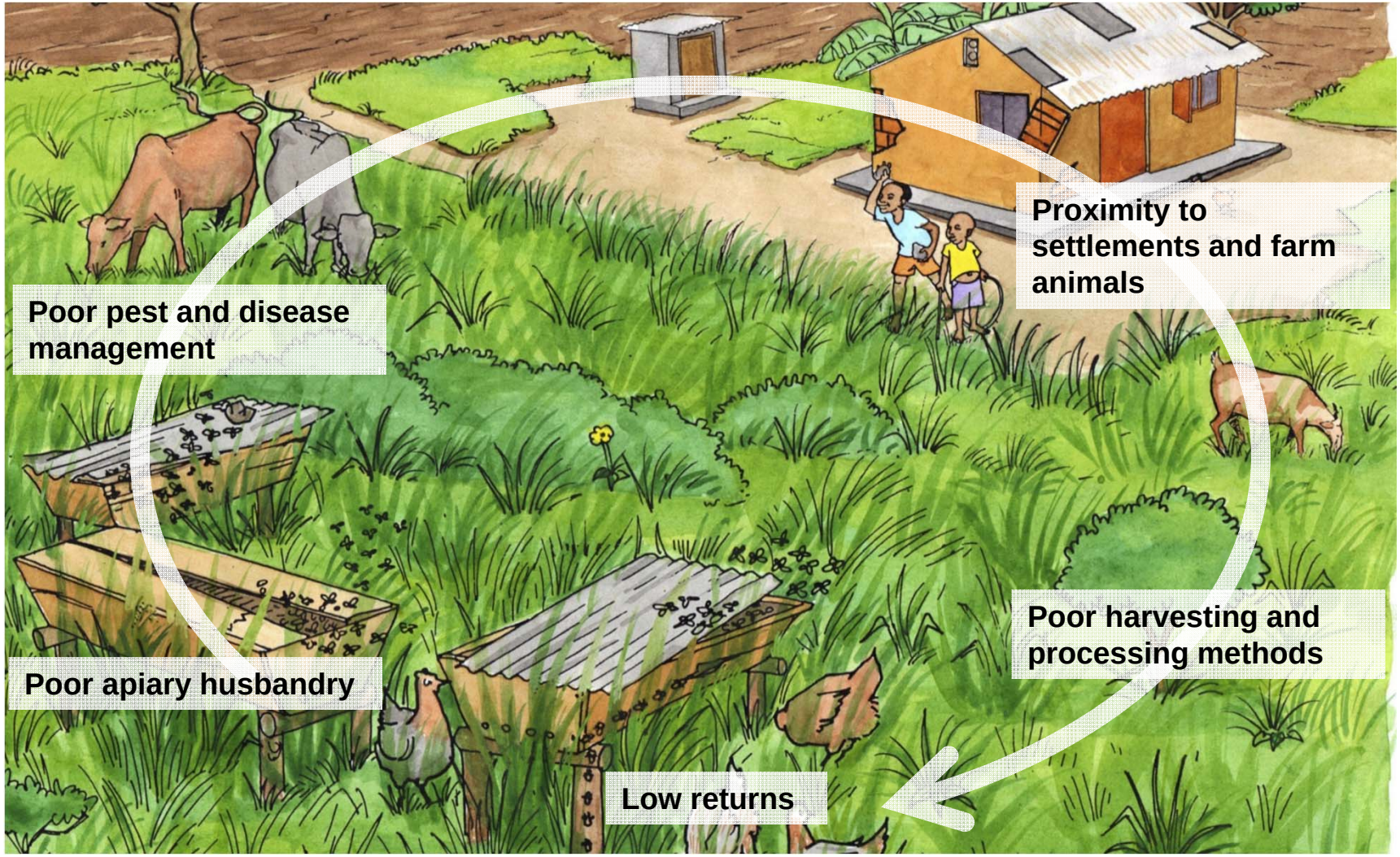
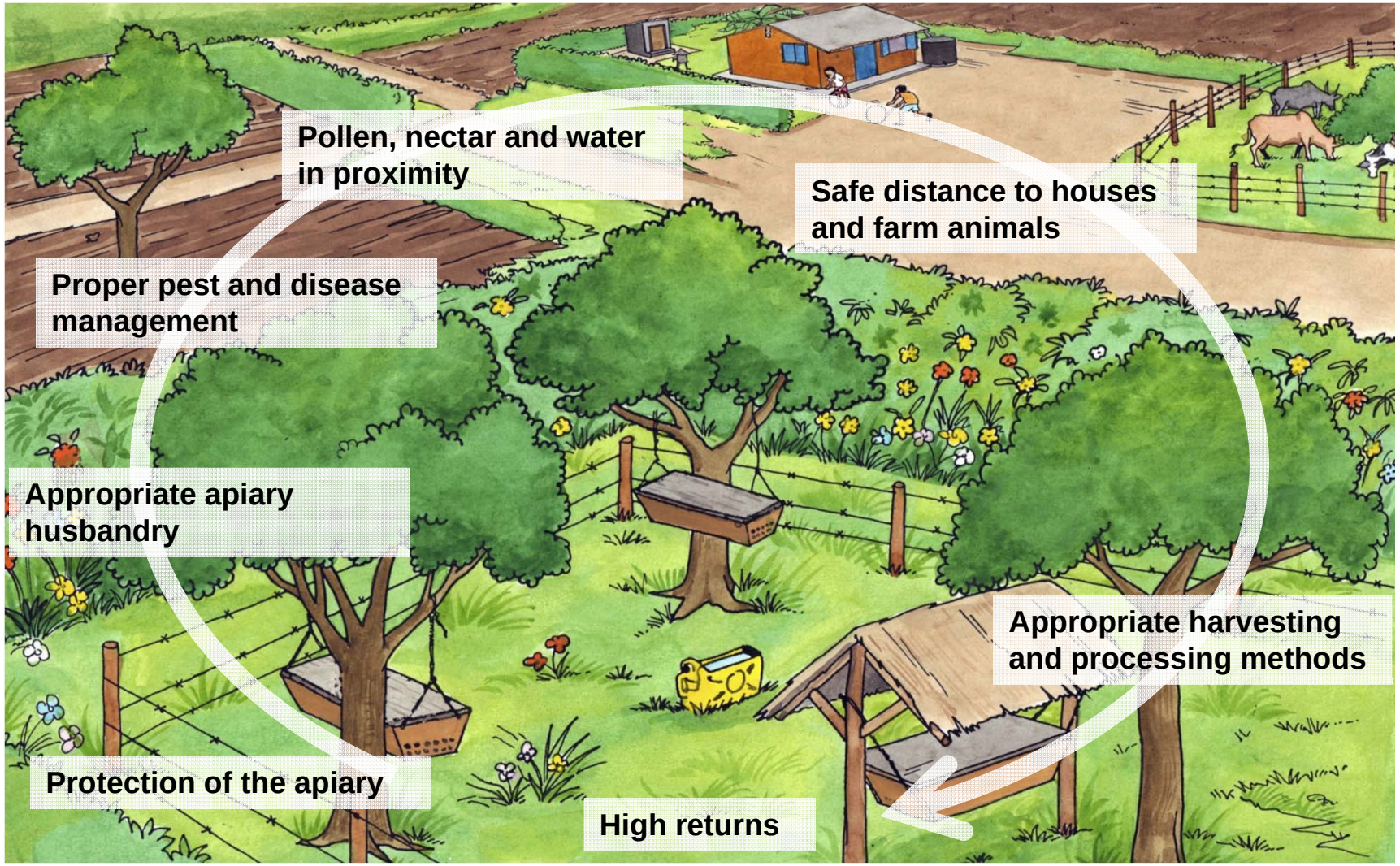
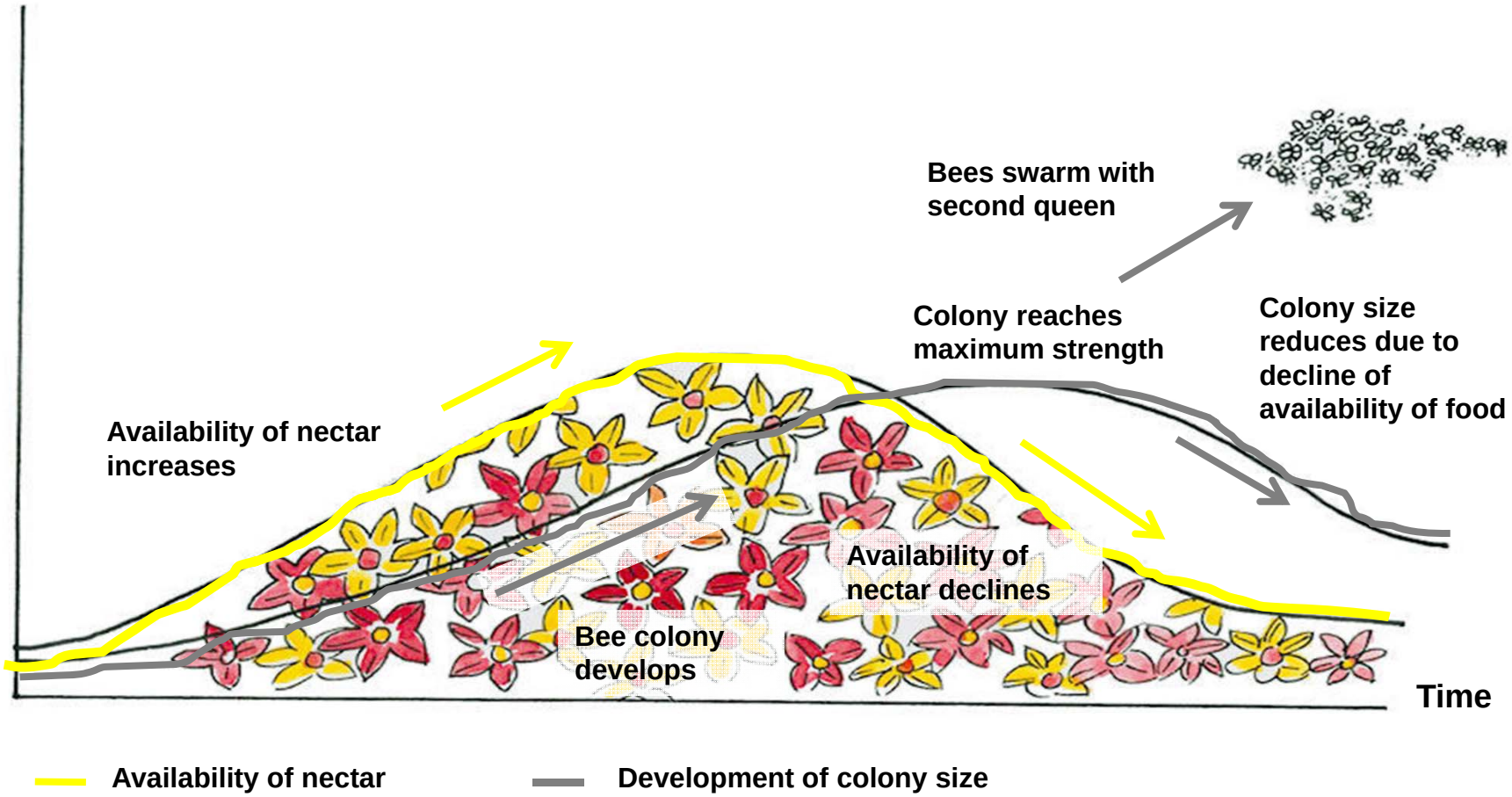
Typical honey production situation



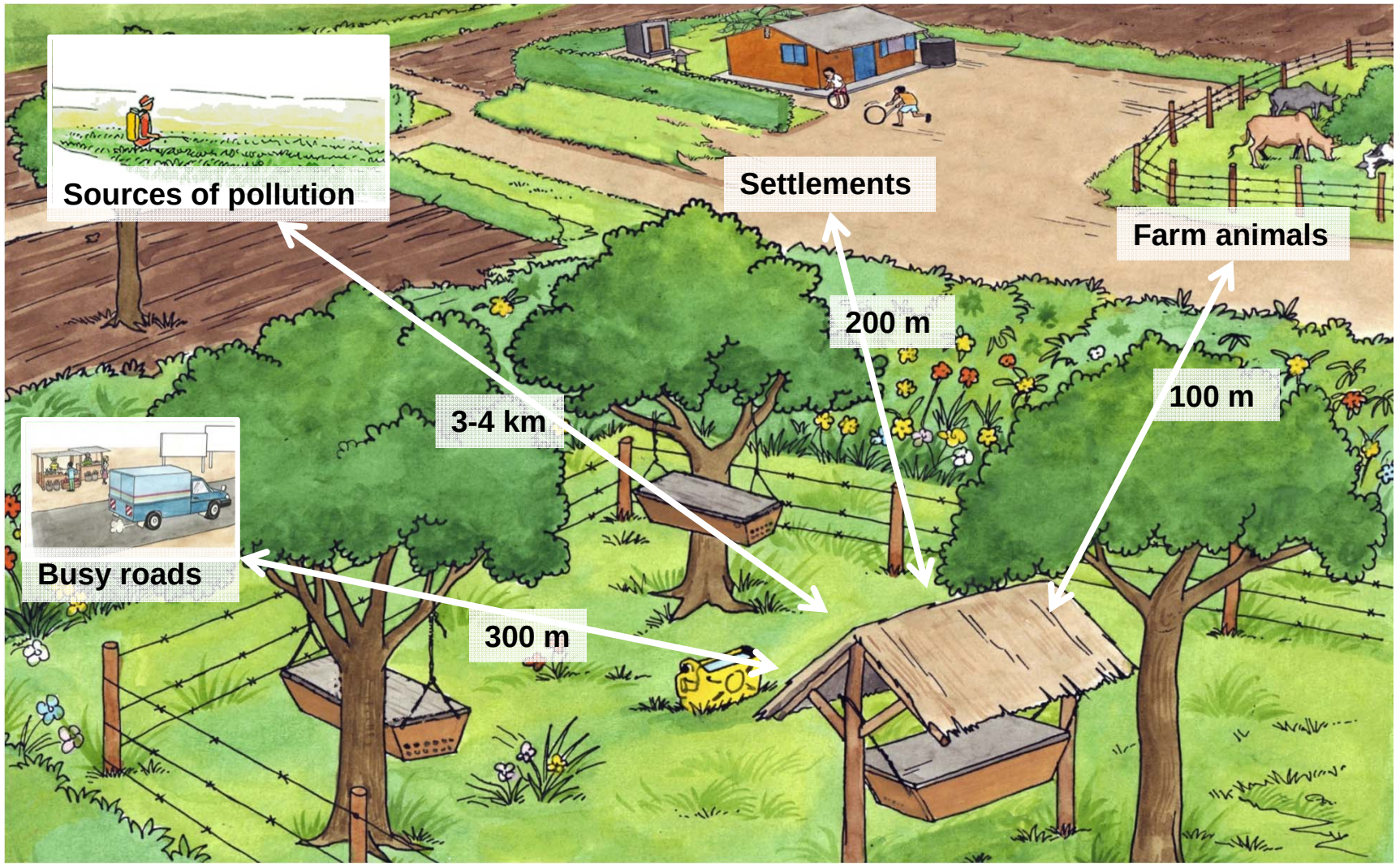
Improved honey production



Natural cycle of a bee colony



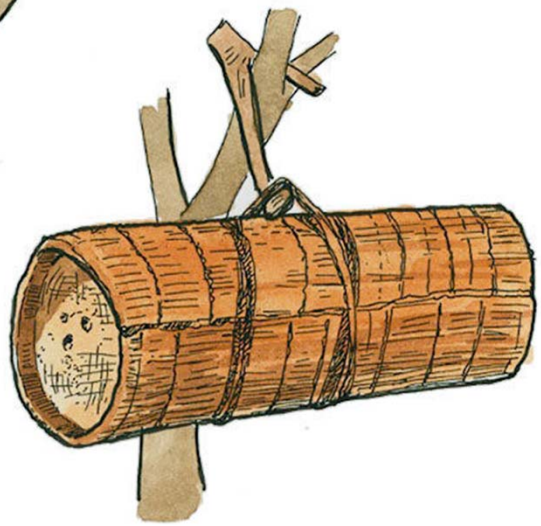
Recommended distances of the apiary



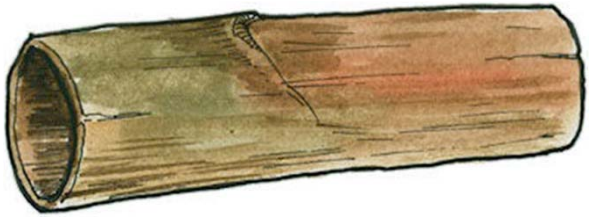
Examples of traditional bee hives

Clay pots

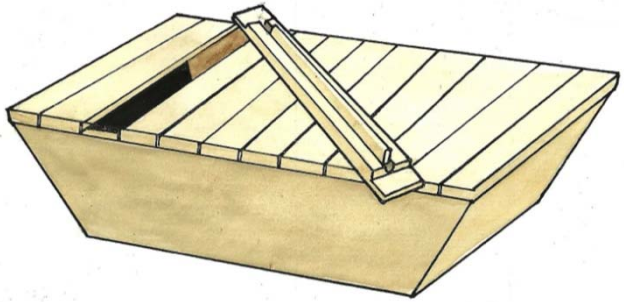
Woven grass



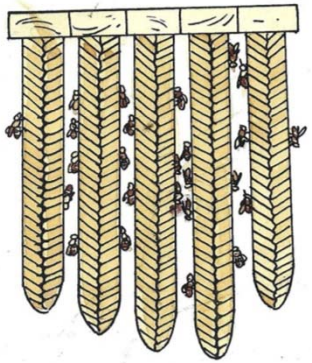
Tree trunk (log)



Removable comb hives with top-bars

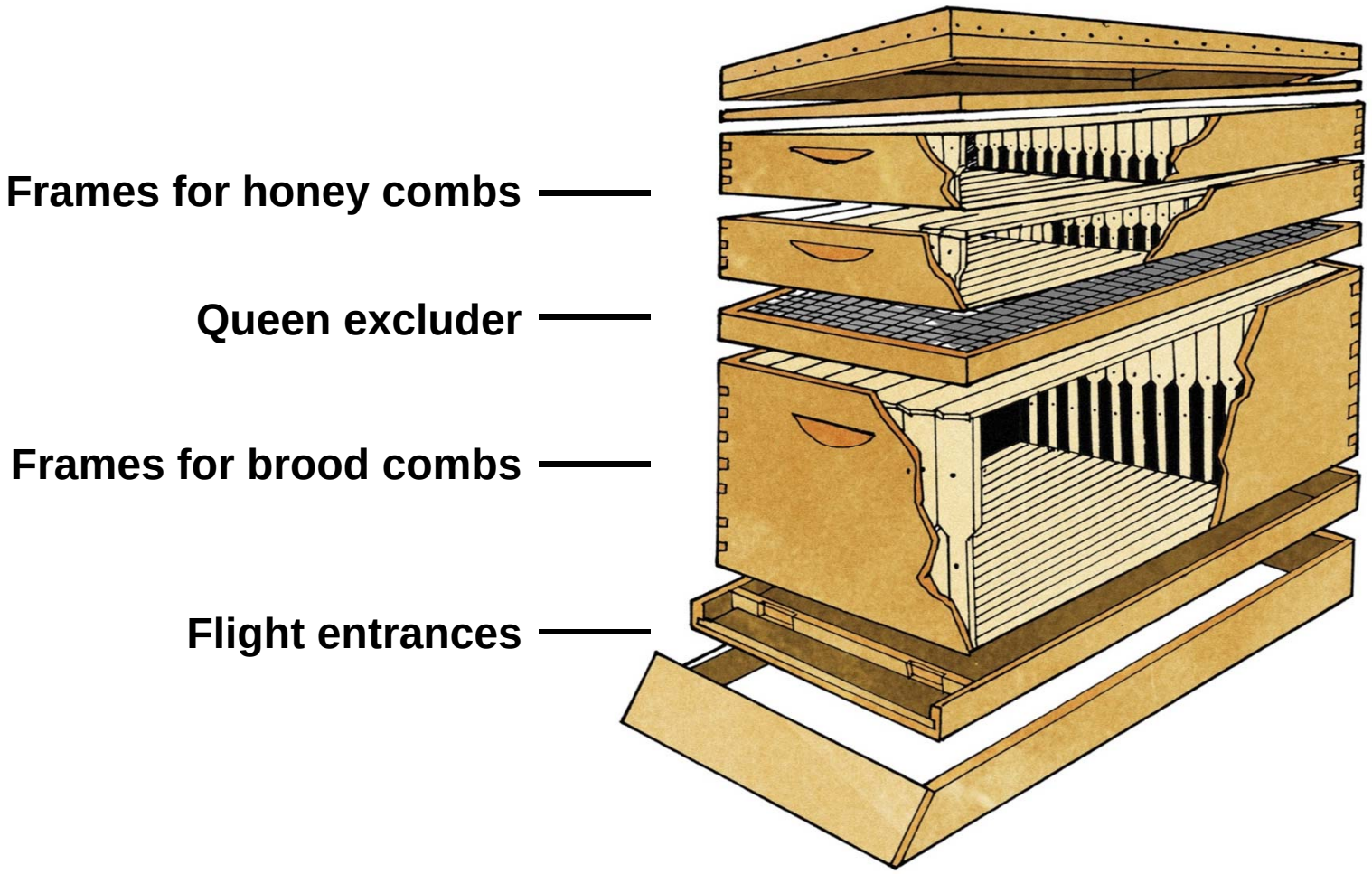


Top-bar hive
with one returned top-bar



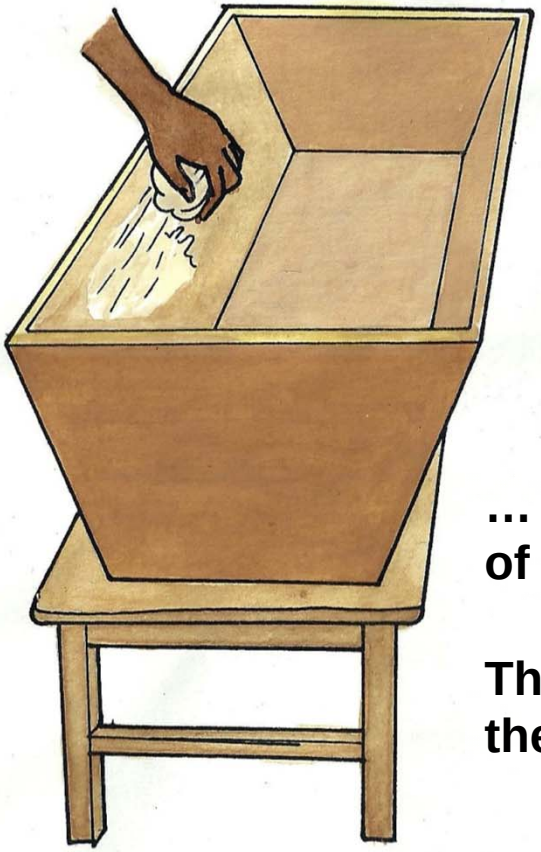
Combs hanging at the top-bars

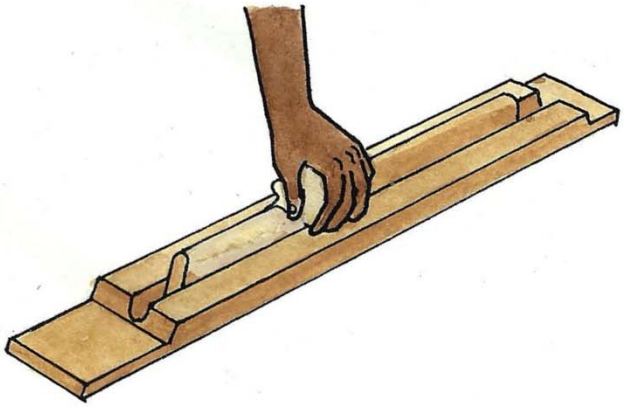
Removable comb hive with frames



Preparing a new hive

Before using a new hive, …





… rub the inside of the hive and the lower part of the top-bars with bees wax.

This will encourage occupation of the hive by the bees and easen the construction of combs.

How to capture a bee swarm

- Wear proper protective clothing.
- Smoke or sprinkle the swarm with cool water to make the bees more docile, if it is in an easily accessible place.
- Shake or brush the swarm into a swarm box, a basket or a box.

- Move the swarm immediately and shake it into an empty hive.

- Empty hives attract swarming bees making it the easiest way of catching a new swarm.

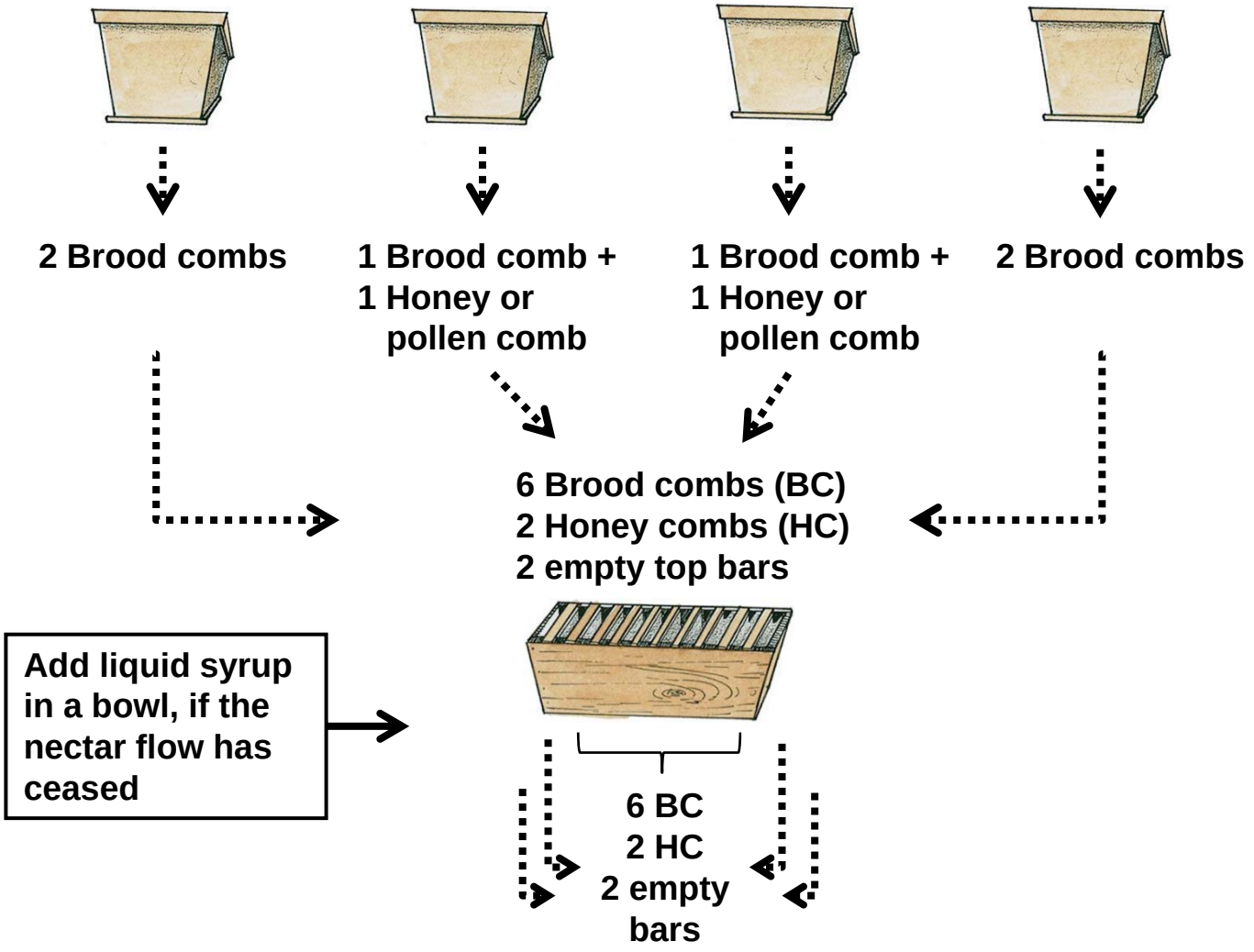
Monitoring of the bee colony

Inspection date:	Apiary No.:		
Observations	**Hive No.:**	**Hive No.:**	**Hive No.:**
Presence of queen or eggs, larvae, capped brood or drone brood			
Presence of food			
Health of bees and brood			
Presence of honey			
Actions taken			
Other remarks			

Basic rules for working with bees

- **Avoid body odour. Wash before working with bees and avoid perfumes.**
- **Wear white protective clothing.**
- **Work when day temperatures are low.**
- **Always use smoke.**
- **Work calmly and slowly.**
- **Take care not to squash any bees.**
- **Limit the working time to 45 minutes.**

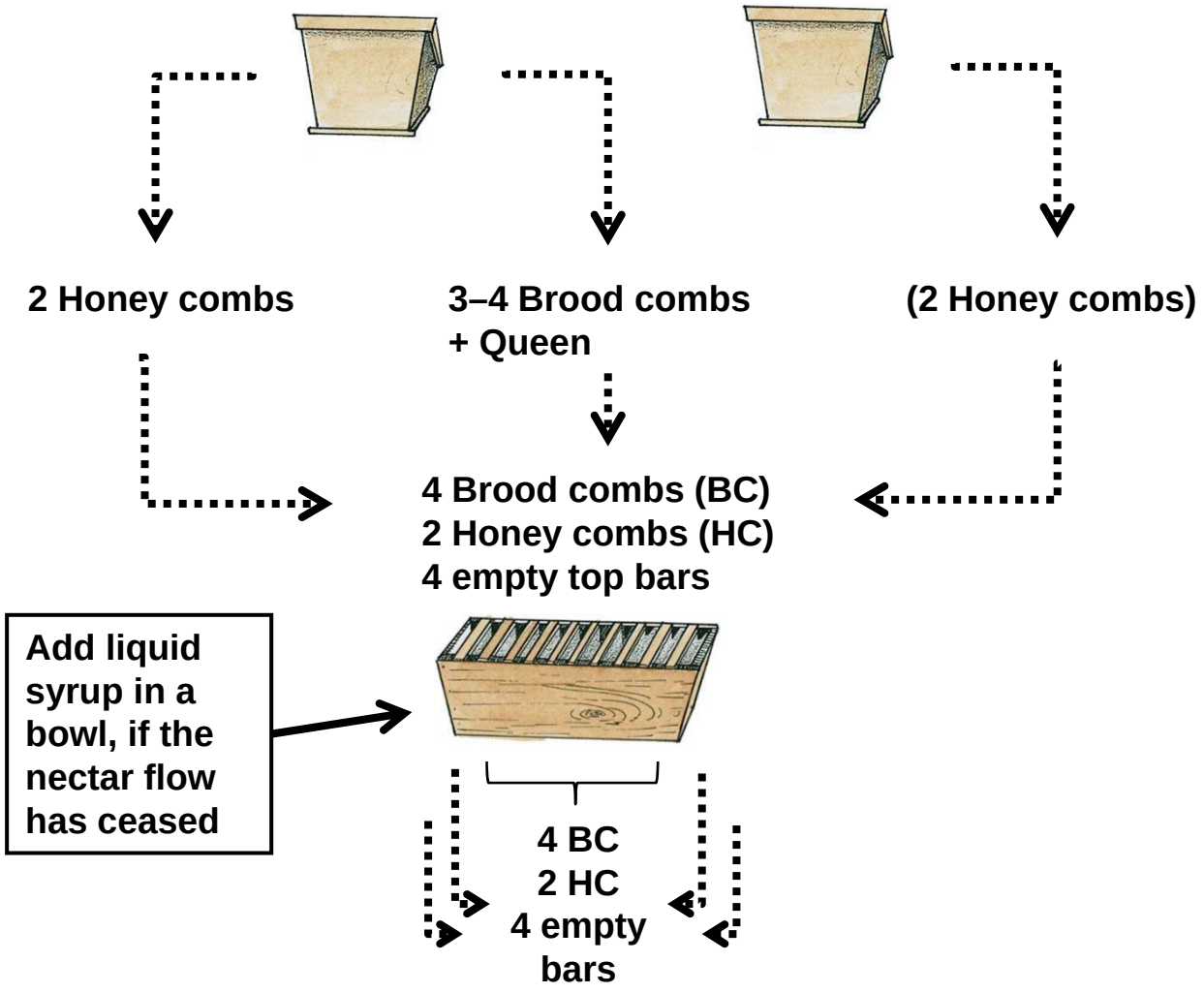
Nucleus formation from different strong bee colonies



How to proceed:

1. **Select colonies that have reached full size.**
2. **Put the selected combs into a new hive.**
3. **Leave the new hive in the same apiary or move it at least 3 km away.**
4. **After 8 days: Select one or two queen cells in the new nucleus.**
5. **After 3 to 4 weeks: Verify if the queen has started laying eggs.**

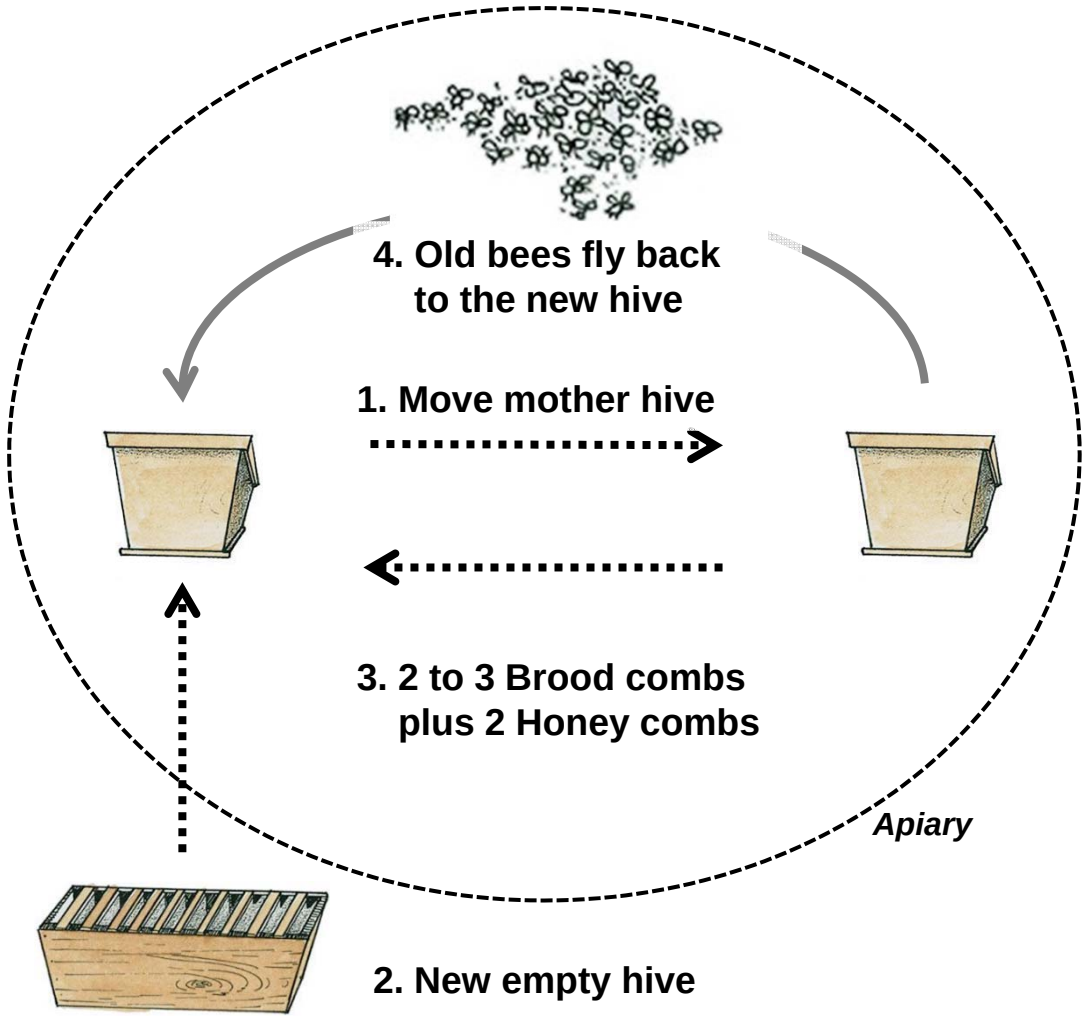
Queen nucleus formation



How to proceed:

1. Select a colony that has reached full size
2. Take 3-4 brood combs from the mother colony plus the queen.
3. If the mother colony is strong enough, take also 2 honey combs. If not, take them from another hive.
4. Leave the queen cells, but leave 1 queen cell for rearing a new queen in the mother colony.
5. After 3 to 4 weeks: Verify if the queen has started laying eggs.

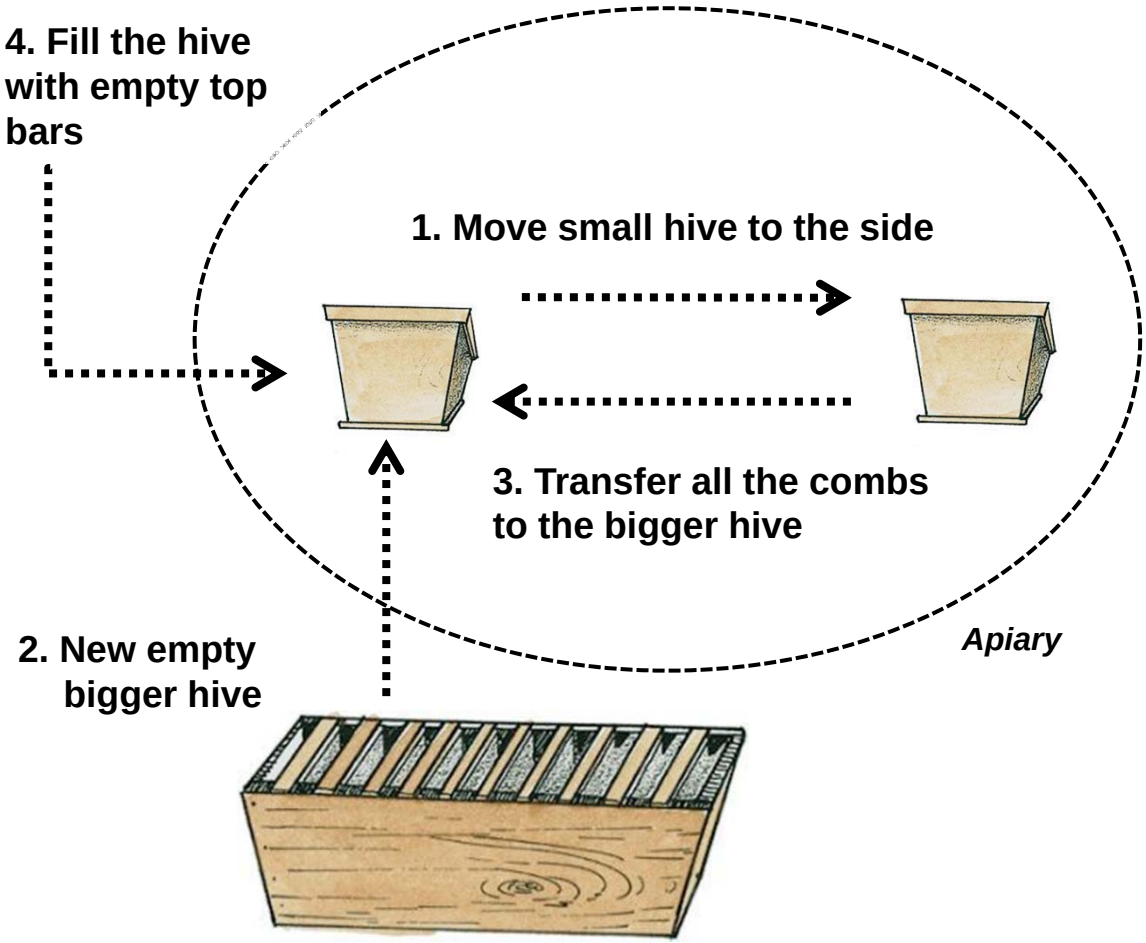
Artificial swarming



How to proceed:

1. Move the mother hive 5 meters away.
2. Place new empty hive in the old location of the mother hive.
3. Put 2–3 brood combs plus 2 honey combs (without bees) into the new hive.
4. Fill the new hive with empty top bars.
5. Old bees will fly to the old location into the new hive and produce a new queen.
6. After 8 days: Remove all queens except one in the new and the mother hive.

Transferring bees from a small to a bigger hive



How to proceed:

1. Move the existing small hive some 50 cm to the side.
2. Replace the old hive with a bigger hive.
3. Smoke the old hive and open both lids of the new and the existing hives. Loosen the frames with a hive tool.
4. Transfer the top bars with the combs one at a time to the new hive in their correct order.
5. Fill the hive completely by adding combs with honey and pollen (or empty top bars) on both sides of the transferred combs.

Beekeeping protective equipment

Head veil

Long gloves

Protective overall

Elastic or tied leg openings

Tools needed for beekeeping

Hive tool

Brush

Smoker

Wax moth damage and control options

Preventive measures:

- To prevent transfer of infested wax to a new colony, melt the wax to a block for storing.
- Fumigation with acetic acid kills adult moths, eggs and larvae on top bars and frames.

Control measures:

- Cut out the infested combs and destroy the larvae.
- In case of severe infestation remove all the wax from the frames and scotch the top bars with hot water and washing soda.

Varroa mite damage and control measures

Varroa mites sucking on a bee

Varroa mites:

- **attack the brood and adult bees and feed on their body fluids.**
- **transmit viral and bacterial diseases causing the bees to become weaker and weaker.**
- **can wipe out a bee colony.**

Infested bees have deformed wings or pinhead reddish brown spots and patches of dead capped brood, which is sometimes chewed open.

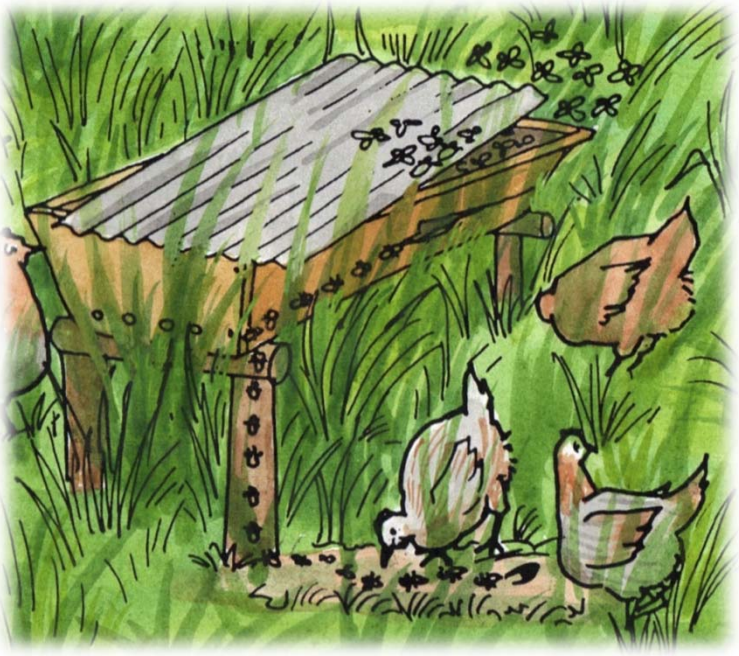
Preventive measures:

- In case of suspicion of varroa mites remove the drone brood in the hive at the beginning of the season.

Control measures:

- In case of severe infestation of a strong colony repeatedly divide the colony using the nucleus queen method.
- Treat the bees with essential oils such as thymol and organic acids such as lactic acid, oxalic acid or formic acid, if available.

Ant and termite damage and control measures



Ants consume the honey and drag the brood out of the hives. Especially 'safari ants' can be extremely destructive to bees.

Preventive measures:

- Regularly clear all vegetation and weeds under the hive stand.

Control measures:

- Spray the apiary floor with a concoction of ground tephrosia leaves, chillies or marigolds.
- Dust the floor of the apiary with diatomite. Avoid dusting the hives and the bees, as diatomite is harmful to the bees.
- Destroy the ant nests in the apiary.
- Hang the hives up on wires at least 1 meter above ground.

Foul brood damage and control measures

American foul brood

Important to know:

- Caused by spore-forming bacteria
- Infects young bee larvae causing them to die.
- The dead larvae decay and produce a smelly glue.

Control:

- Burn the colony, the combs and top bars/ frames.
- Disinfect the hives.
- Restrict propagation by not using the honey for other hives, by not exchanging frames, bars and hives from other apiaries.

European foul brood

Important to know:

- Bacterial disease
- Causes death of larvae, decay and stench in the hive and produces foul smell.
- Commonly occurs in the rainy season and most colonies recover by the end of the rains.

Control:

- Remove all affected combs.
- Isolate the queen in a queen cage in the hive for up to 10 days to allow workers to clean the hive.

Sac brood damage and control measures

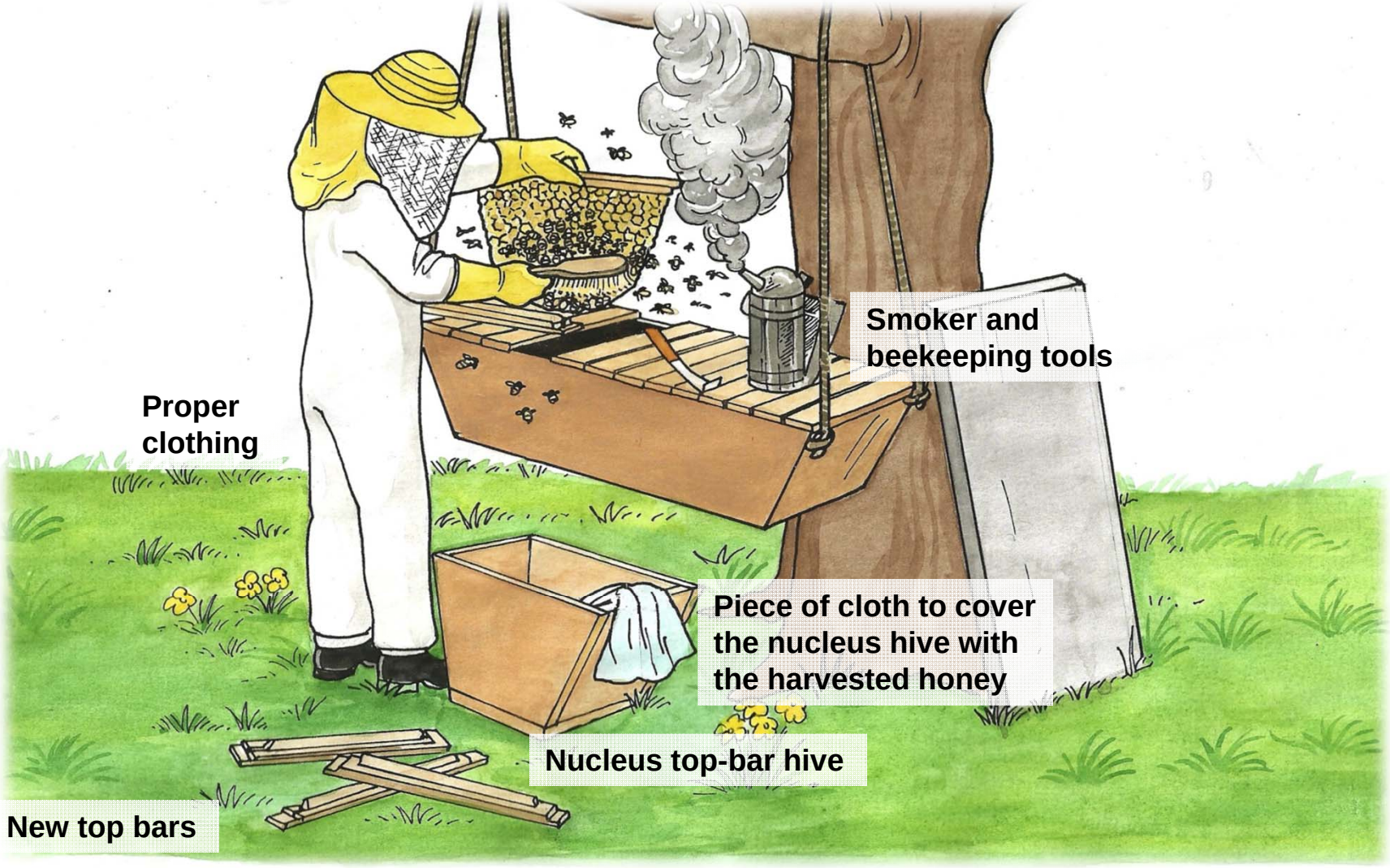
Important to know:

- Caused by a virus
- Similar symptoms to European foul brood, but produces no foul smell.
- The larvae die in early stage leaving a watery sac at the bottom of the cells which turns into leather-like scales.

Control:

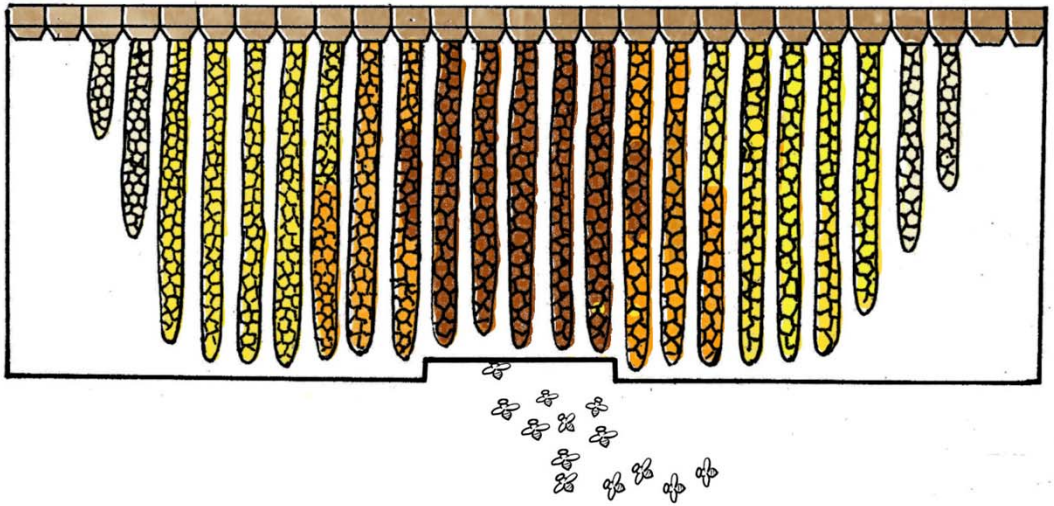
- Remove all affected combs.
- Isolate the queen in a queen cage in the hive for up to 10 days to allow workers to clean the hive.

Equipment for harvesting honey

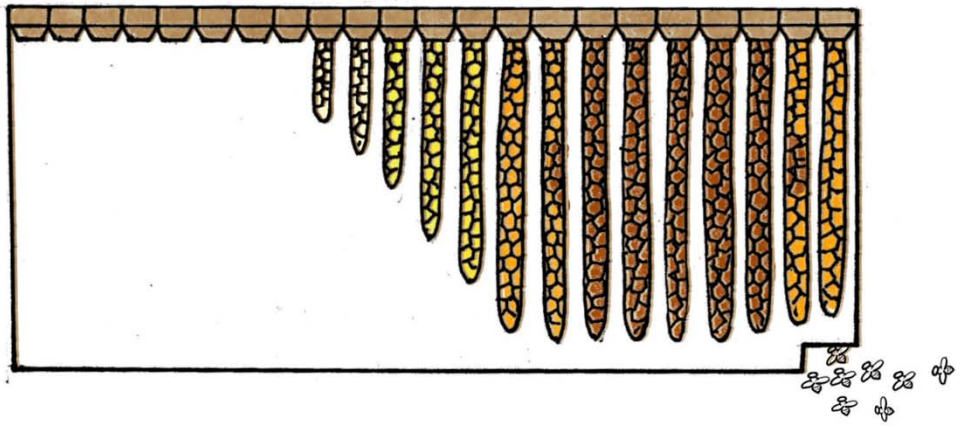


Comb arrangement in different hive types

Hive with bee entrance on the long side



Hive with bee entrance on the short side



Capped honey combs **Brood combs** **Combs with pollen** **Uncapped honey combs**

Distinction of brood and honey combs

Top-bar with brood combs

Top-bar with honey combs

Make sure to distinguish capped brood combs from sealed honey combs! In case of uncertainty open some combs to be sure to harvest honey combs only.

How to proceed for harvesting honey

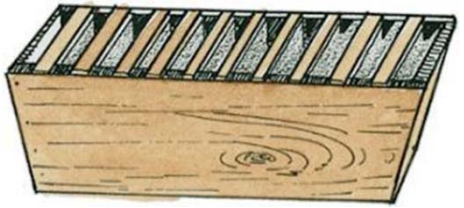
1. Smoke the flight entrance, wait a moment and open the hive slowly.

2. Sparingly smoke the inside of the hive and wait a minute.

3. Remove some of the honey combs carefully.

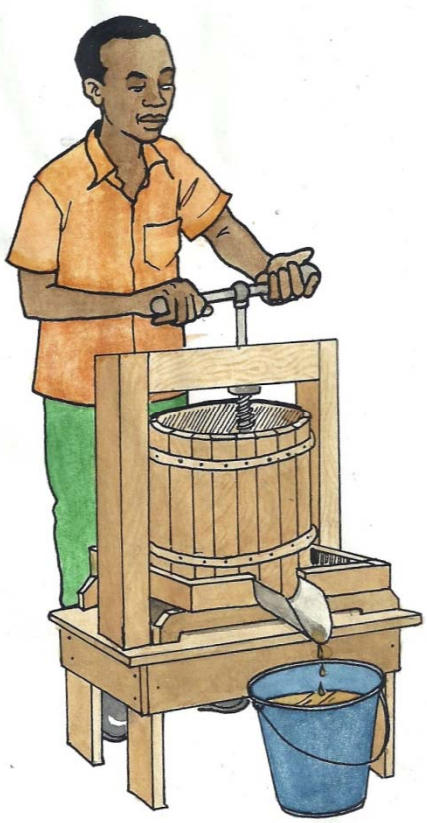
4. Carefully wipe off the bees from the combs.

5. Place the top-bars or frames into a nucleus hive and cover them for safe transportation.

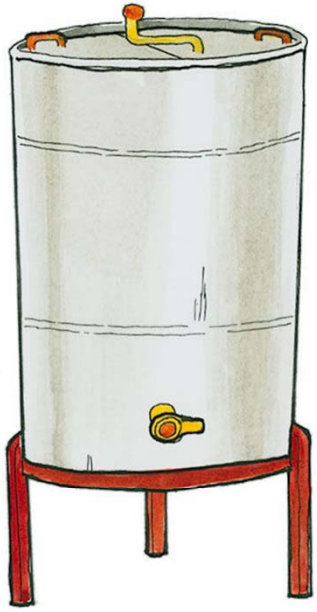


6. Move the remaining honey and pollen combs next to the brood combs and refill with empty top-bars or frames.

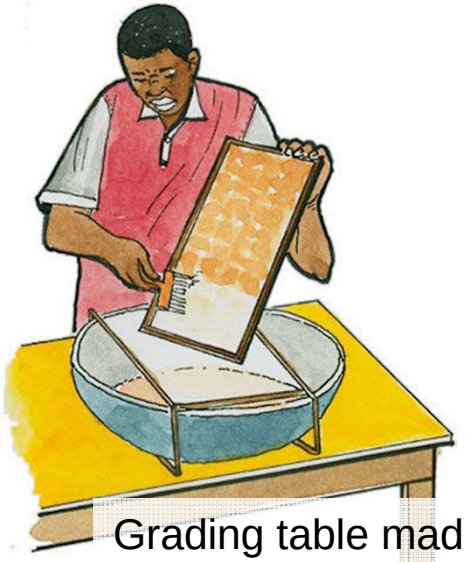
Equipment for processing honey



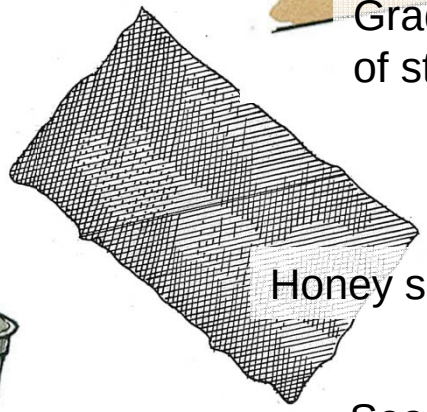
Honey press



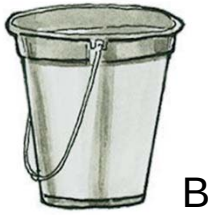
Honey extractor



Grading table made of stainless steel



Honey sieves and filter cloth



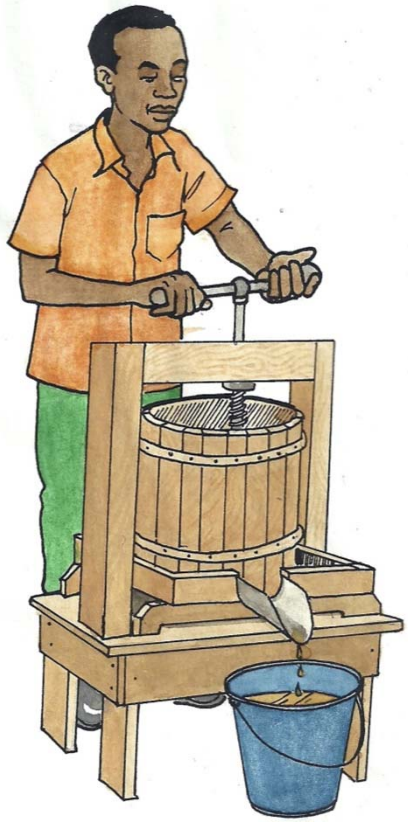
Buckets

Sealable honey containers for storing extracted liquid honey

Ways of extracting honey

Floating:

› Very simple, but very slow



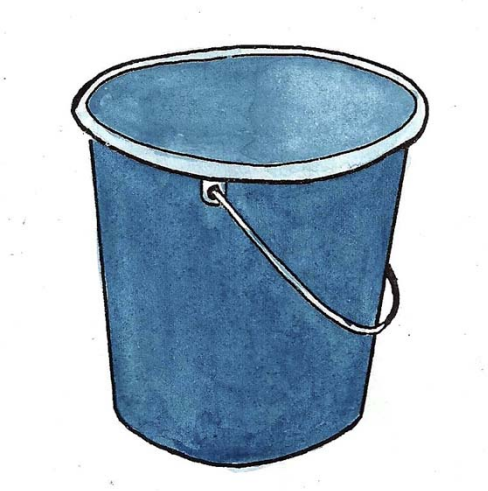
Honey screw press:

› Simple and efficient

Honey extractor:

› Engine driven, fast extraction by centrifuging

Honey extraction by floating



How to proceed:

1. Break the combs into small pieces and let the honey settle in a sealed container.
2. When the honey has settled, skim off the wax that floats on top.
3. Strain the honey through a filter cloth.
4. Store the filtered honey for one day and skim off floating wax particles.

Processing the wax

1. Put the wax into a pot.

2. Add the double volume of rainwater and heat the mixture.

3. When the wax has melted, pour the mixture through a rough sieve.

4. Allow the wax to cool and rise to the surface.

5. Scrape off the debris at the bottom of the wax plate.