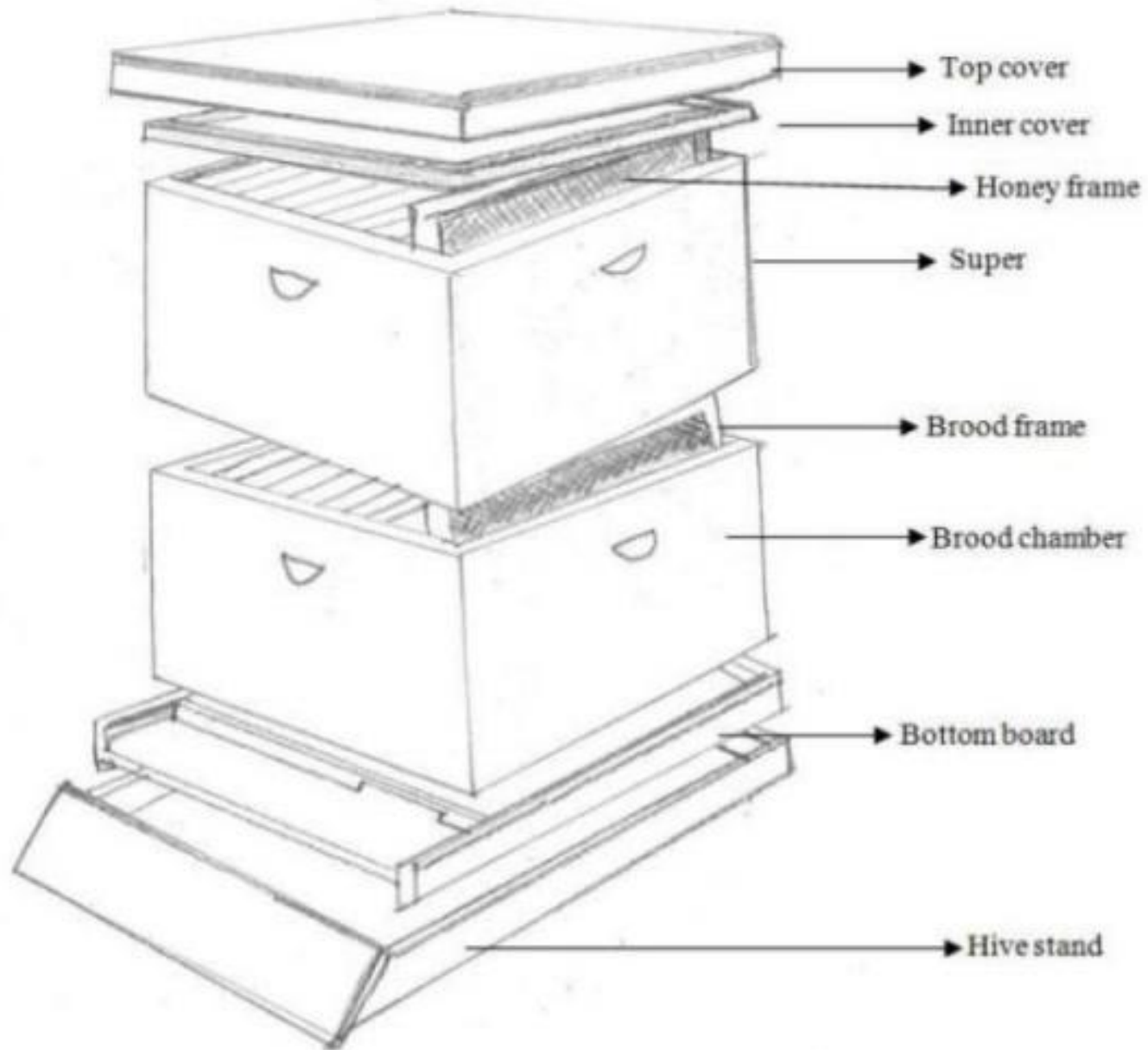


Beekeeping Equipments



Bee Hive

- **L.L. Langstroth** discovered the principle of bee space in **1851** in the U.S.A.
- This space permits free passage for worker bees and is too small to build a comb by bees or too large for depositing bee glue i.e. propolis.
- Bee space is optimum distance between two surfaces in a bee hive essential for normal movement and functioning of bees.
- The bee space measures **9.52 mm** for *A. mellifera* and this was modified for *A. cerana* to be between **7 and 9 mm**.
- Wood having strong smell is not used for making hive.



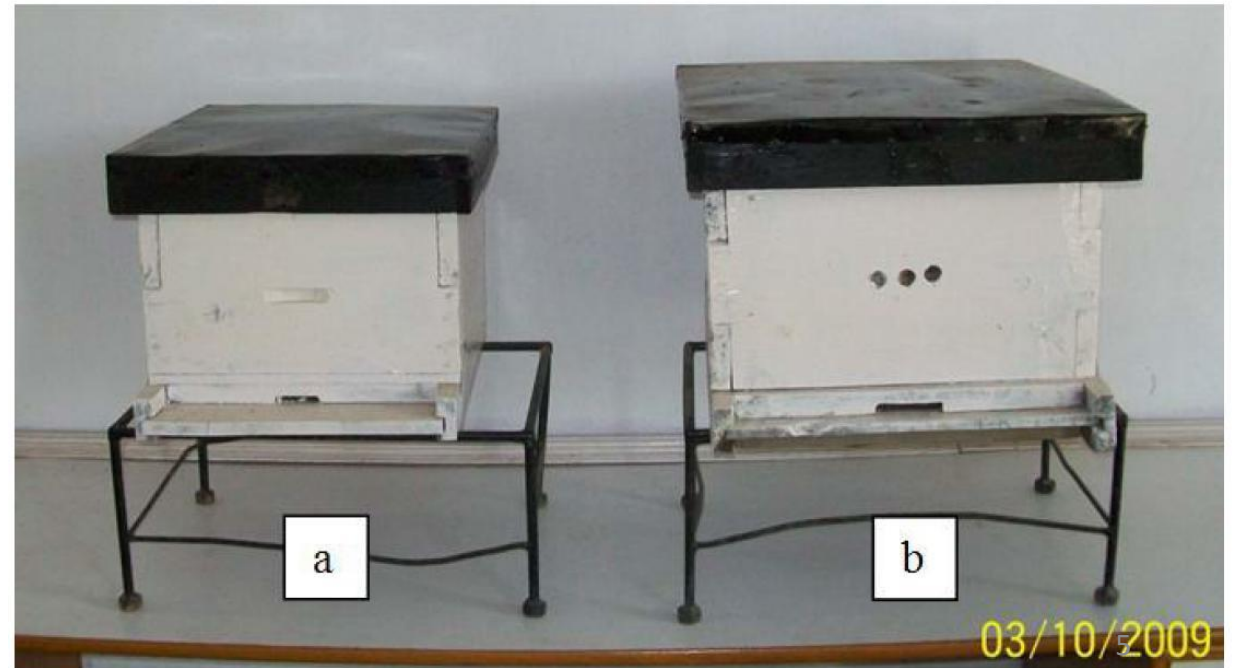
Parts of a movable frame hive

Parts of Hive

- **Stand:** To support bottom board.
- **Bottom board:** It is floor of the hive having an entrance for bees. On this board brood chamber rests.
- **Brood chamber:** Chamber used for rearing of brood. Frames are placed in this chamber on which bees raise combs. The dimensions and number of frames vary with the type of hive. A wooden dummy board is used to limit the size of brood chamber and is placed at the end of brood frames.
- **Super:** Dimensions may be same as that of brood chamber or half of it (depending on type of bee hive). This is the chamber where bees store surplus honey.

Parts of Hive

- **Frame:** Each frame consists of a top bar, two side and a bottom bar. Inner aspect of the top bar has a groove for fixing comb foundation sheet. Side bar has 4 holes for wiring the frame. The frame holds a comb.
- **Inner cover:** A board which acts as a partition between brood/super chamber and the roof .
- **Top cover:** A type of lid acting as roof placed over inner cover.



Other Equipments

- **Nucleus hive:** Small bee hive for keeping 4-6 frames. These are used for mating of queens and division of colonies.
- **Observation hive:** Small hive with glass sides so as to observe movements and behavior of bees.
- **Uncapping knife:** Large sized knife used to uncap the frames before honey extraction.



Observation hive



Nucleus hive

Other Equipments

- **Comb foundation mill:** Used to print natural cell size of desired comb foundation sheet for *A. mellifera* and *A. cerana*.



Comb Foundation Mill

- **Bee veil:** Used for preventing bee stings on face and neck.



Bee Veil

- **Smoker:** Used to calm down the bees while opening the hive.



Beekeeper's Clothing



Protective suit



Veil



Gloves



Shoes

Other Equipments

- **Hive tool:** An iron strip used for opening of hive and its cleaning.
- **Queen cell protector:** A spring like structure for protecting queen cells.
- **Bee brush:** To brush the bees from frames.
- **Queen cage:** Used to introduce a queen to new colony and also to transport the queen.



Other Equipments

- **Swarm basket:** Basket to catch bee swarm.
 - **Feeders:** Different types of feeders are used for feeding sugar syrup to the bee colonies.
- Feeders can be:
1. **Slow feeders** (friction top pail feeders) in which holes are made in the lid and the feeder is placed inverted inside the hive
 2. **Fast feeder** (division board feeder) which is of the size of a regular frame and the trough contains a wooden float inside the cavity.



Swarm Basket



Feeders

Equipments

- **Queen excluder:** Perforated zinc sheets or round wires assembled in such a way that workers can pass through them and queen cannot (perforation size is **4.20 mm** for *A. mellifera* whereas worker thorax size varies from **3.33 to 3.50 mm**).
- It is used during honey flow season to restrict queen to brood chamber and thereby preventing egg laying in the super.
- It is also used in maintaining multiple queen system in a colony.



Queen excluder

Equipments

- **Honey extractor:** It is a machine to centrifuge out the honey from uncapped frames.
- **Wax melter:** Double walled chamber for melting of bees wax for making comb foundation sheets.



Honey Extractors



Wax Melter



Solar wax melter 12

Equipments

- **Pollen trap:** For trapping corbicular pollen of returning bee foragers.
- For *A. mellifera* pollen trapping screen has holes of **4.7 to 5mm** and for *A. cerana* **3.5 to 3.7mm**.
- **Bee escape:** To provide one way passage to bees.



Two types of bee escapes (Different views)



Pollen Trap