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Queen Production Methods

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Introduction

- The quality of a queen is very important for successful beekeeping.
- Continuous selection and multiplication of the best colonies is vital for genetic improvement.
- Colony characteristics such as population growth, pollen and nectar collection, storage capacity, disease resistance, and gentleness are all determined by the genetic quality of the queen.
- All the bees in the colony, including the male drones, are offspring of the queen; thus she is the only member of the colony to pass on genetic traits.
- Requeening colonies annually helps to keep them strong and healthy.

Queen production is carried out for the following reasons:

- Requeening of a queen-right colony or queening of a queenless colony
- Requeening to replace the queen in a non-productive colony
- Sale of queens to others
- Sale of colonies through colony multiplication

Introduction

- A queen cell is specifically developed by the bees in a colony to produce a queen. It is larger and longer than the worker and drone cells. A structure on the comb resembling a cow teat is a queen cell.

- Two methods can be used for queen production: natural and artificial.

Natural Queen Production

- Honeybees produce queens naturally for three different reasons:
- Swarming
- Supersedure
- Emergency

- Beekeepers can encourage natural production of queens by creating a queen-producing environment in a colony at a favourable time of year.

Swarming queen cell

- Honeybees have an impulse to swarm during the favourable honey flow season to multiply the colony.
- Queen cells developed at the edge of the brood comb with the acceptance of the queen and workers are swarming cells (Figure).
- Preparation for swarming begins with the development of many swarming cells.
- These cells produce good quality queens and can be used in requeening and when dividing colonies.

Supersedure queen cell

- Supersedure is the intentional replacement of a queen in a queen-right colony through the preparation of one or more queen cells by worker bees (Figure 54).
- Usually one or more queen cells are prepared in the centre or at the side of the face of the brood comb to replace an old queen because she is underperforming (old, injured, diseased, laying unfertilized eggs, has diminished pheromone production), and the queen is forced to lay eggs in these cells. After the new queen emerges, she mates with drones and starts laying eggs.
- The workers usually kill the old queen. In general, a colony practising supersedure does not swarm. Older queens are superseded more frequently than younger ones because of the diminished performance and pheromone production.
- These queen cells can also be used for requeening other colonies or for colony division.

Emergency queen cell

- If the colony accidently becomes queenless, the worker bees start developing many queen cells 1 day later from fertilized eggs or from young larvae.
- These are called emergency queen cells (Figure 55).
- They may be scattered in any part of the brood comb.
- Queen cells developed in an emergency are smaller and not all are of good quality.
- Swarming may also take place from emergency queen cells.

Artificial Queen Production

- Queens can be produced artificially from a selected colony at a favourable time.
- The beekeeper prepares queen cells using beeswax and grafts 1–2 day-old larvae from the worker cells into the queen cells with the help of a grafting needle.
- The nurse bees feed royal jelly to the grafted larvae, take care of the cells, and prepare mature queen cells, which can then be separated and transplanted to a queenless colony or nucleus colony.
- The ideal time for queen rearing is different in different parts of the Hindu Kush-Himalayan region depending on the specific geography and climatic situation.
- Ideally it should be carried out during the honey flow period and under favourable weather conditions (warm and dry).
- This means March to April and September to October in plains, hills, and mid-hills areas, and around June in mountain areas.

Colony selection for queen production

- Each colony in an apiary should be numbered for easy record keeping. Records should be maintained of different functions so that the genetic characteristics can be evaluated. Selection of colonies to produce queens and drones should be based on the following qualities.
  - Strong and healthy
  - Gentle
  - Low tendency to swarm and abscond
  - Population grows even in the dearth period
  - Good nesting behaviour, cover brood combs even in unfavourable seasons
  - Resistant against pests and diseases
  - High capacity for honey and pollen collection and storage

Selection of a queen cell

- The colony may have several queen cells of different quality. The following should be considered when selecting a queen cell:
- Choose a queen cell that is being attended and protected by a large number of workers.
- Choose a cell that is long and cylindrical (bigger cells generally have better quality queens).
- Retain two queen cells of different maturity.
- Remove any other queen cells to control swarming.

Requeening, queen release and replacement

- If a new queen is placed directly in a colony she may be attacked and killed by the workers. The following methods can be used to avoid this.

Queening using a queen cage

- Remove all the queen cells from all the combs in a queenless colony.
- Make a queen-right colony queenless 24 hours before requeening.
- A queen that is going to be used for requeening should be kept in a queen cage with 5–6 attendant nurse bees and a cotton ball or pieces of cotton cloth soaked in honey.
- Place the queen cage with queen between brood frames in the colony.
- After 24 hours in the colony, give a few puffs of smoke and then release the queen from the queen cage. If the released queen is covered by worker bees or they start climbing on the queen or teasing the queen wings, then re-cage the queen for a further 24 hours.

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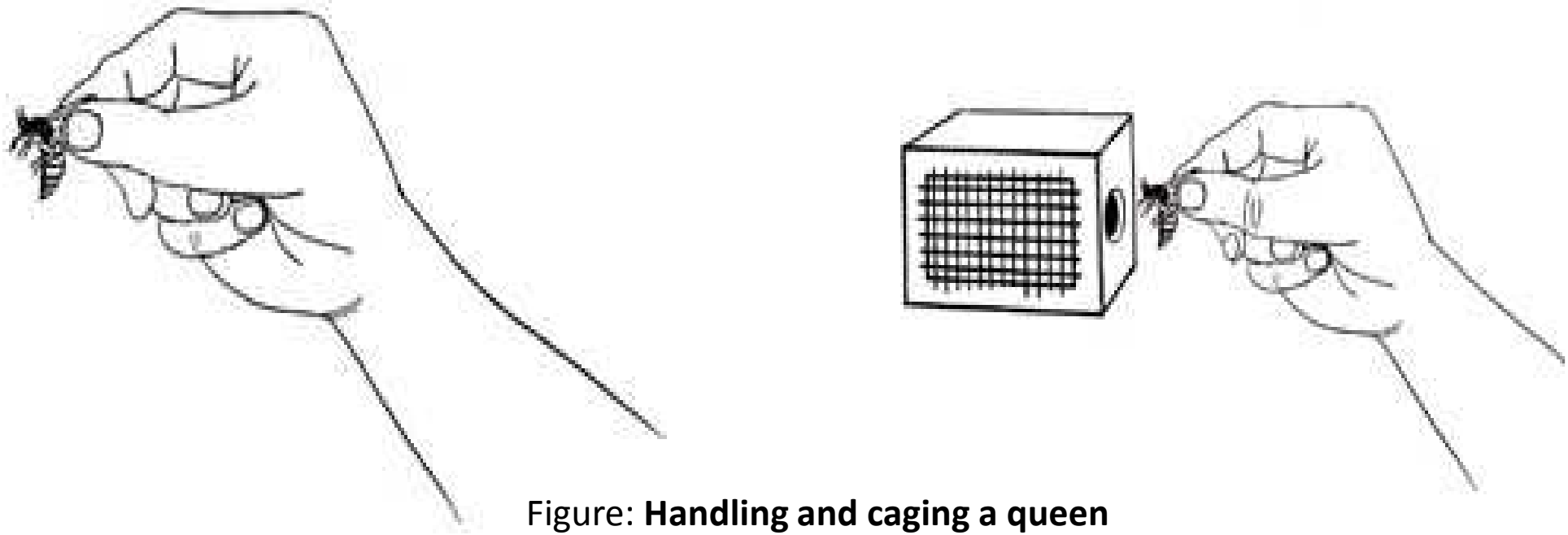


Figure: **Handling and caging a queen**

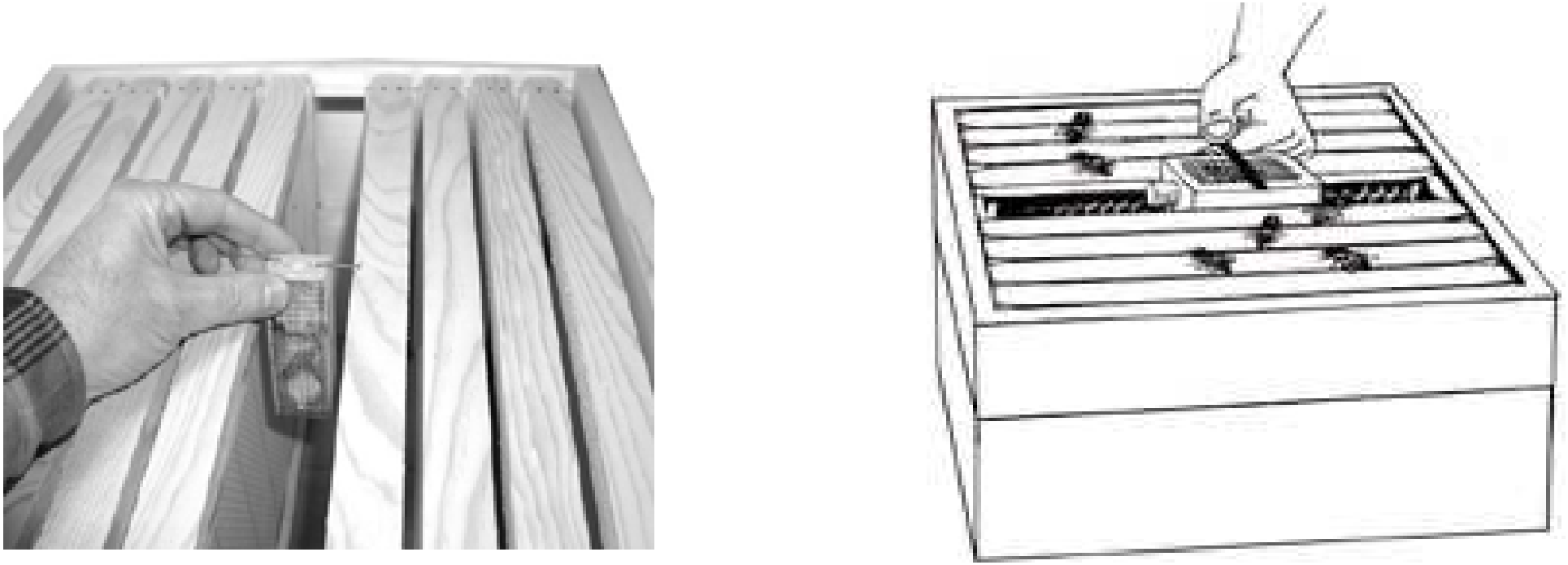


Figure: Placing a queen in a colony

Grafting a queen cell

- Use a knife to carefully cut out a selected queen cell together with a small piece of comb. Remove a brood comb from the centre of the brood chamber of the queenless colony and cut a space the size of the cell and comb piece at the edge of the comb. Place the queen cell and comb in the space and fix in place with a bamboo needle.
- Inspect the colony every 2–3 days to confirm queen emergence and queen laying. If egg laying does not start within 15 days, remove the queen and either introduce a new queen, graft a new queen cell, or unite the colony with a queen-right colony.
- Sometimes, the new queen may lay unfertilized eggs as a result of the absence of drones during her mating flight and/or an unfavourable environment for mating, and drones start developing in the worker cells. If this happens, the queen should be removed and another queen or queen cell introduced, or the colony should be united with a queen- right colony

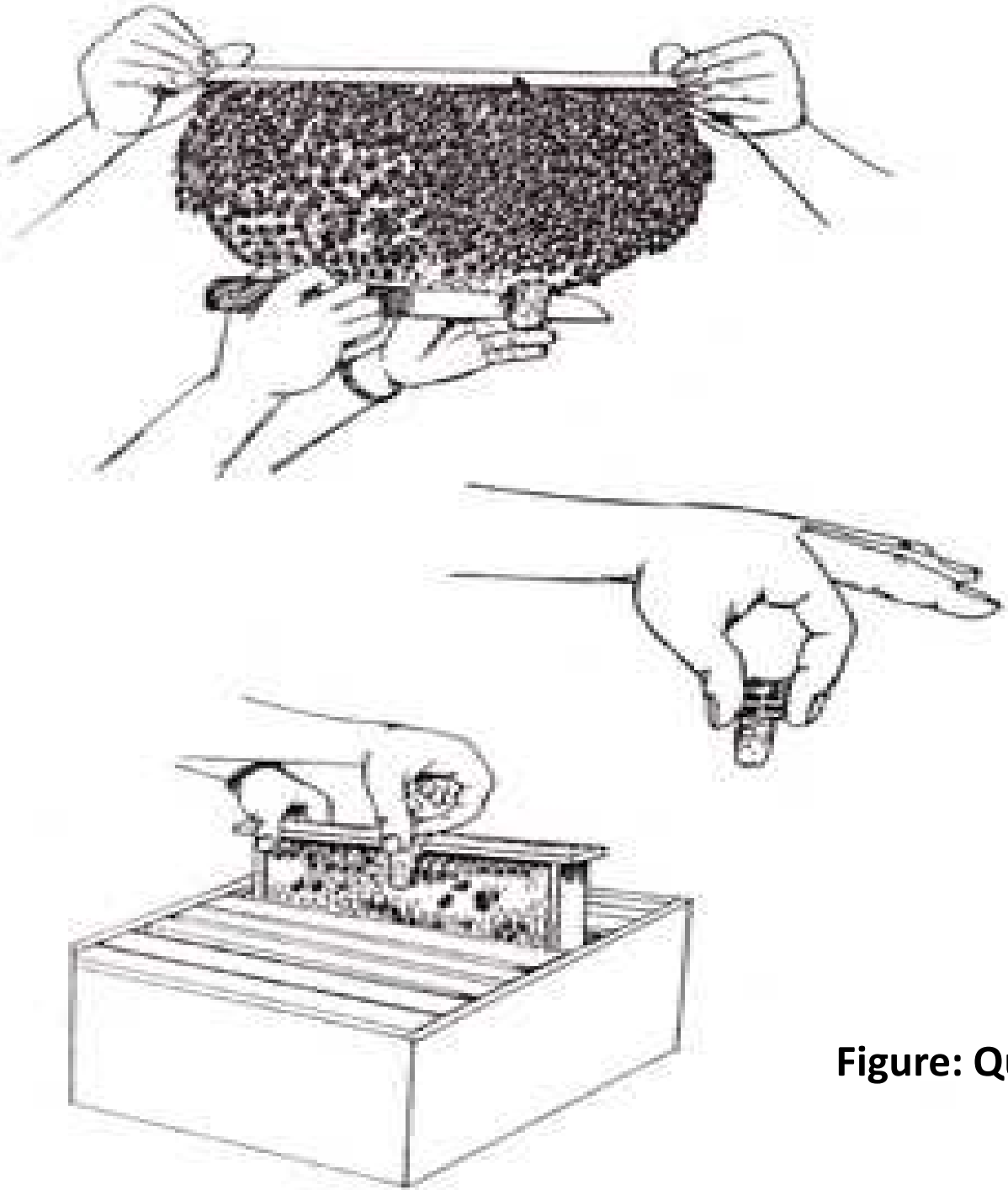
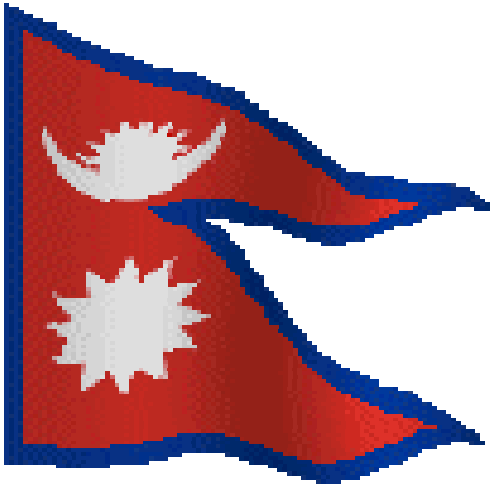


Figure: Queen cell grafting



Thank you
for your attention