

PRACTICAL 13

MANIPULATIONS FOR HONEY PRODUCTION

Aim: To learn manipulations required for quality honey production, safety of honey bees and increasing colony productivity.

An understanding of all the seasonal and miscellaneous management practices described under different chapters is required for manipulation of bee colonies for honey production. However, additional information is required for the commercial beekeepers to fully exploit the potentials of bee colonies. Brief information on some of the important aspects is given below:

1. Use of queen excluder
2. Use of good combs
3. Preventing bee losses
4. Selective breeding
5. Bee forage management
6. Adoption of scientific migratory beekeeping

1. Use of queen excluder:

To get quality honey, it is recommended to use queen excluder (Fig. 13.1 and 13.2) to get super combs without brood. If queen excluder is not used, the queen moves to the super chamber to lay eggs. Honey should be extracted only from the supers and stores in brood chamber should be left for the colony.



Figure 13.1 Queen excluder placed over brood chamber



Figure 13.2 Super placed on queen excluder

2. Use of good combs:

It is important to secure good combs for use in the bee colonies to increase their efficiency and quality of produce. Honey stored in old and dark combs becomes darker. Combs older than 3-4 years should be discarded. Best time to raise combs is during honey flow when the bees construct comb fully from top to bottom bar. Poor combs should be removed as and when found. In older combs even queens are reluctant to lay eggs. There are reports which indicate that continuous use of combs for brood rearing results in reduction of cell size which in turn affects the bee size.

3. Preventing bee losses:

Large number of bees dies due to indiscriminate use of pesticides on the crops. Poisoning of bees occurs due to following reasons:

- Most of the bee poisoning occurs when insecticides are applied to crops during the blooming period.
- By drifting of toxic pesticides onto adjoining crops or weeds that are in bloom.
- Contamination of flowering cover crops when orchards are sprayed.
- Insecticidal dusts adhere to foraging bees and ultimately become packed with the pollen onto the hind legs. Insecticides Penncap-M and Sevin are especially dangerous because they may be stored with pollen and kill newly emerged workers the following season.
- Bees drinking or touching contaminated water on foliage or flowers.
- Bees collecting contaminated pollen or nectar.

Symptoms of bee poisoning

- Large number of dead bees in front of hive:
 - 100 bees /day normal death rate
 - 200-400 /day low death rate
 - 500-1000/day medium death rate
 - over 1000/day high death rate
- Bees also die in between field & hive

- Bees become paralytic; loose power of orientation
- Abdomen distended, tongue extended
- Bees become irritated and sting heavily
- Regurgitation of gut contents
- Brood chilling due to reduced bee population
- Queen may stop egg laying or lay in irregular pattern
- Longevity of adult bees reduced due to sub-lethal doses

Prevention of bee losses

- Do not spray on blooming crops
- If necessary, spray only during early morning or late evening
- Use proper dosage and safe pesticides
- Avoid combination of pesticides
- Use safe formulations; fine sprays less toxic than coarse; wettable powder more hazardous than emulsifiable or water soluble concentrates
- If colonies are kept in the field for pollination, cover them with burlap cloth
- Ensure that there is no blooming cover crops in the crop to be sprayed
- Local bee keepers should be warned before application of pesticides
- Feed colonies with sugar and pollen/pollen substitute
- If poisoned pollen stored by bees, bees & brood may die even after pesticide application: remove combs with stored poisoned pollen & soak in water for few hours; wash by shaking
- Provide brood and bees to weak colonies

4. Use of selectively bred stock:

Selection of breeder colonies

Breeder colony represents the mother of queens to be raised. The welfare of a colony depends on inherited and physical qualities of its queen because queen transmits to the colony all the characteristics pertaining to disease resistance, longevity, industry, temper, swarming tendency and even excellence in raising combs. Breeder colonies can be selected for:

- Increased honey production
- Fast spring build up
- Disease resistance
- Frugal and strong overwintering qualities
- Heat tolerance
- Good handling qualities or gentleness (With least sting attitude)

Different subspecies or the already existing bee stocks, form the gene pool for the bee breeder. From the existing stock desirable bees can be bred. Import of new germplasm is in no way substitute to selection programme. Further import of fresh germplasm may be of questionable benefit as it may have undesirable traits or may combine with existing stock to produce undesirable hybrids.

5. Bee forage management:

Bee forage management involves large scale plantations of forage for bees. But it is not economical to a beekeeper to plant forage exclusively for bees. However, plantation of bee forage having other multiple uses too can be undertaken under different programmes. Plantations made on waste lands and as roadside plantations as well as community forestry are some of the examples. Reports of flourishing apiculture after taking up roadside plantations, under social forestry and community plantations in different countries like China, India, Nepal etc. point out to the success of increasing bee forage.

The bee forage which is selected for large scale plantations should have some desired qualities like:

- Long blooming period
- High density
- Good nectar quality having high sugar concentration etc.

In addition to these qualities, if the desired forage is to be planted as food source for dearth period in an area, then it should bloom during that period only. However, if the selected area in general is poor in terms of bee flora, the floral plants to be planted should bloom for most of the period for which different plants having different period of bloom can be selected.

6. Adoption of scientific migratory beekeeping:

To overcome limits of carrying capacity of different areas, beekeepers migrate their colonies to different potential areas. Thus migratory beekeeping is taken by beekeepers to exploit different honey flow sources or even for providing bee colonies for pollination on rental basis to the orchardists. In India, the commercial beekeeping is at present based on exploiting only honey flow sources and to a limited extent for pollination of apple (restricted to Himachal Pradesh). Colonies are rented out for pollination @ Rs 600-700 per colony for flowering duration of the crop.

Benefits of migratory beekeeping

- The income of beekeepers that migrate their colonies increases more than three times than those who practice stationary beekeeping.
- Due to migratory beekeeping natural resources in the form of nectar and pollen are utilized which otherwise are going waste.
- Migratory beekeeping provides free ecosystem service in terms of pollination of variety of wild and cultivated plant species of the area.
- Beekeepers taking up stationary beekeeping have to bear lot of cost in feeding and packing of bee colonies which is also saved in migratory beekeeping.