

PRACTICAL 9

SEASONAL MANAGEMENT OF HONEY BEE COLONIES (SPRING MANAGEMENT)

- Aim:** 1) To understand basic principles of honey bee management.
- 2) To understand management practices required for scientific management of honey bee colonies during spring season.

All the management practices needed for increased honey production revolve around the following basic principles of bee management:

- i) Ensuring built-up of foraging force of bees at right time for collection of surplus nectar.
- ii) Providing space for storage and ripening of nectar into honey by the bees.
- iii) Removing honey from hive at right time and extracting it.
- iv) Preparing the colonies to withstand any period of dearth and menace of bee enemies.

Generally, beekeeping activities start with the onset of spring in cold areas. Therefore, it is appropriate to know the management practices, starting from spring. However, in some parts of the country there are different seasons and the management varies as per season.

1. SPRING MANAGEMENT

The advent of spring, particularly in northern parts of the country, marks the beginning of warm weather and blooming of several tree species and cultivated crops. Following management practices are performed:

- Remove the protective covering of lightly packed hives in the early spring. But in the heavily packed colonies, the packing is removed only when daily maximum temperature has reached 16°C.
- Examine the colonies on a sunny day. Check the food store and general condition of the colony. The examination should be for short duration to avoid brood chilling and robbing
- It is a good practice to equalize the strength of normal colonies in an apiary by giving brood frames to the needy colonies
- The colonies which do not have brood, are likely to be queen less or if queen has failed and has become drone layer, there will be predominance of drone brood. Such colonies if are weak (less than 5 frames), be united with other needy normal colonies. If these are strong, then provide a mated queen and if not available, give a frame of brood with eggs and young larvae for rearing new queen
- Give stimulatory feeding of sugar syrup (dilute syrup; 30 per cent) to the bee colonies on the onset of spring which is indicated by the start of blooming of spring flowers. Take all the steps to guard against the robbing by bees. Bees will put their whole force during this period for brood rearing
- Provide raised combs or frames with comb foundation sheets if raised combs are not available so that there is no shortage of space for brood rearing. But be careful not to over expand the brood in the uncertain weather conditions of early spring, which may result in chilling of brood. Once the colony is strong enough to cover the brood, there is no risk of this problem

- Examine the colonies at least once a week on a sunny day and when conditions permit, clean the debris from the bottom boards. Provide empty frames as per needs of the colonies. Ensure that each colony always has at least 5 kg of food stores
- During spring old bees die which are normally replaced by young bees. If mortality of old bees exceeds the rate of emergence of young bees, the colonies show sign of dwindling which is known as spring dwindling. Such colonies should be provided with adequate stores of pollen and honey and be given 1-2 sealed brood frames from the strong colonies.

If all above mentioned practices are followed, the colonies will be well built up by the time of honey flow when maximum strength is needed. However, increase in strength also induces swarming.

In warmer areas of the country, all these practices can be carried out during early summer.

What is swarming? This is a natural instinct for increase in the number of colonies. Division of colony takes place in which worker bees (30 to 70 per cent), fill their honey stomachs with the food and leave the colony along with old queen and this divide, called as swarm, settles down temporarily generally in the nearby area of the colony on the bushes, hedges, tree branches etc.

Period of swarming: It occurs when queen has reached her peak of brood rearing activity under the stimulus of incoming pollen and nectar, mainly in late spring or early summer, but can also occur during summer or fall, depending upon floral conditions of the area. This generally occurs during the period before honey flow.

What causes swarming? Swarming occurs due to:

- Overcrowding and lack of ventilation.
- Presence of old queen
- Sudden honey flow
- Lack of space for egg laying and honey storage.

Problems due to swarming:

- Loss of working force due to division of the colony
- The morale of colony is not favourable for honey collection. The bees direct their efforts towards building queen cells and searching for new home sites
- Colonies show great variations in respect of swarming. Some colonies do not swarm even after becoming quite populous yet many swarm without any apparent reason indicating genetic variations to the instinct of swarming. *A. cerana* is more prone to swarming than *A. mellifera*.

Indication of swarming:

- The colonies start raising large number of queen cells usually along the lower edges of combs (Fig. 9.1). However, few emergency queen cells are also raised in the event of queen failure i.e. supersedure (Fig 9.2).
- Many bees do not go to field creating additional crowding, resulting in clustering of bees outside the hive.

Time of swarming: Time to issue swarms by the colonies is from 10AM to 2PM on sunny days. If weather is not favourable, swarms may be issued even earlier in the morning or late in the evening.

Catching and hiving a swarm:

- A settled swarm can easily be caught using swarm catching basket (Fig. 9.3). This basket is placed above the bee cluster and the cluster is gently pushed upwards so that the bees start ascending into the basket. Once the queen has entered, the whole swarm will follow the queen
- The swarm in this basket can be taken to the apiary for hiving
- To make the swarm settle properly, a hive is prepared by giving one frame each of capped brood, pollen and honey and provided with extra frames as per strength of the swarm.
- The swarm from the swarm catching basket is then shaken on the top bars of such a prepared hive and immediately covered with burlap cloth, inner cover and top cover
- Sugar syrup is also fed to such a newly settled swarm (1 part sugar dissolved in 1 part of water).

How to prevent and control swarming? Depending on the internal and external factors, one colony may issue one to several swarms resulting in loss of population of the parent colony. To prevent swarming do as given below:

- Avoid overcrowding by adding empty combs for egg laying. Sealed brood can be shifted to second hive body
- Remove the queen cells at regular interval as soon as these are made. Delay in queen cell removal is not much effective
- Provide shade and ventilation to the colonies
- Swarming can be prevented by removing old queen (which otherwise provides the supersedure impulse) followed by introduction of a young laying queen. Requeening the colonies annually is also a good practice
- Another well known method of swarm control is “Demaree plan of swarm control” which is described below:
 - Examine the brood of the colony and remove all the queen cells
 - Remove the brood chamber from the bottom board. Place another hive body containing one comb of unsealed brood, eggs and the queen on this bottom board. Fill the remaining hive with empty combs.
 - Place queen excluder on this hive body and keep the removed brood chamber along with remaining brood and bees over it
 - Again inspect the top hive body after 10 days and remove all queen cells that may have been built in this interval. In 21 days, all of the brood will have emerged in the upper body and it will be used for honey storage. In this way swarming can be checked.
- Swarming instinct of the colonies can also be overcome by temporarily dividing the colony and then re-uniting them just before honey flow.



Figure 9.1 Large number of queen cells raised on lower side of the comb during swarming



Figure 9.2 One emergency queen cell (Supersedure cell) raised on upper part of comb in the event of failure of queen



Figure 9.3 Swarm of bees on tree trunk being collected using swarm catching basket

Practical things to do:

- i. Clean the bottom board of its debris content by removing the brood chamber. Examine the debris and record its contents
- ii. Check condition of queen, food stores and whether the colony needs more frames. Record your observations.
- iii. Inspect the bee colonies for any indication of swarming (large number of queen cells).