

PRACTICAL 12

MISCELLANEOUS MANAGEMENT

(Dividing, uniting, queen management, supplementary feeding, shifting bee colonies, robbing, absconding)

Aim: To become familiar with different manipulations required in the management of bee colonies during different periods which includes uniting, dividing, queen management, supplementary feeding, robbing, absconding, etc.

During different seasons as described earlier, different manipulations are done. These manipulations have been described separately under miscellaneous management since these may or may not be season specific.

1 Colony multiplication/dividing of colonies:

- Catching of swarms is an old method to increase the number of colonies but this method should not be encouraged since the colonies raised from swarms will have the swarming instincts. Moreover, this is a time consuming method
- Spring is the best season for increasing number of colonies by dividing the colonies which are not as strong as others and sparing these colonies from honey production. Such colonies can be divided into nuclei with two to three frames of bees and each nucleus is given a queen cell or new queen. These nuclei should be fed with 50% sugar syrup
- Another method to increase the colonies is before the honey flow when colonies are having peak population. Remove 2-3 combs of brood and bees from strong colonies to make nuclei. This will not affect the strength of the strong colonies and these can avail honey flow well due to strong condition. This also reduces the chance of swarming. The nuclei are given new queen or queen cells.

2. Uniting of bee colonies: The colonies to be united should be brought close to each other by moving 1 metre each day so as to avoid drifting of bees. When they are near to each other (within one metre), the colonies can be easily united using newspaper method in which few small holes are punctured in the paper and placed over the brood chamber of the colony. Place the brood chamber of other colony (without bottom board) over the first colony which is now separated by punctured newspaper. The bees will gradually mingle together by gnawing the paper.

Precaution: Keep the better queen and remove poor queen before uniting.

When the necessity arises?

- During fall, uniting weak colonies which cannot overwinter well.
- Just prior to honey flow, uniting weak colonies to make one strong colony.
- During spring when equalizing the strength of colonies by providing frames from strong to average colonies.
- Queen less colony is to be united with queen right colony when no spare mated queen is available or queen cannot mate due to non availability of drones or bad weather.

3. Robbing and its prevention: Robbing is stealing of food store by bees from other colonies.

What causes robbing?

- Exposure of colonies for long duration during examination
- Exposed sugar syrup or its spillage near apiary
- Careless feeding of weak colonies
- Robbing is more during lean period when there is little nectar in the field.

How can we identify robber bees?

- Robber bees become smooth, shiny and dark coloured due to repeated attack of guard bees
- Robbing bees generally do not alight at the hive entrance boldly and face the guard bees with fear. They try to sneak in the hive through cracks and crevices.

Prevention of robbing: For an attentive beekeeper robbing is not a problem. Following precautions are needed:

- Never leave combs of honey exposed and examine the colonies quickly during dearth period
- During feeding avoid spillage of sugar syrup near apiary
- Take special care of weak colonies while feeding, since these are prone to robbing. Try to make weak colonies strong by uniting weaker ones. Feed such colonies in the evening.
- Do not keep honey combs exposed after honey extraction. These combs are given back to the colonies only in the evening when foraging activity has stopped.

Control of robbing: If inspite of taking precautions the robbing is prevalent, manage colonies in the following manner:

- Reduce the entrance of the colony and close all other cracks and crevices
- Place wet grass in front of entrance of colony being robbed
- Sprinkling of repellents like carbolic acid or kerosene at hive entrance will also discourage robbing
- The colonies being robbed badly may be shifted to new site in the apiary after reducing entrance and throwing green grass at the hive entrance.

4. Absconding: It is desertion in which the whole colony leaves the hive. *A. cerana* is more prone to absconding than *A. mellifera*.

Causes:

- Shortage of food reserves
- Attack of bee enemies
- Too much disturbance and handling.

Prevention:

- Keep colonies strong and ensure that each colony has at least 5kg of food stores
- Avoid broodlessness in the colonies. If a colony is broodless, provide 1-2 frames of young healthy brood.
- Check the colonies for diseases and attack of bee enemies. Manage colonies accordingly.

5. Supplementary feeding of bees: Bees require supplementary feeding when the food stores are poor. Supplementing the food stores of bee colonies with sugar syrup and pollen substitute/pollen supplement is known as supplementary feeding.

When do the bees need feeding?

- When the colonies do not have sufficient stores in fall for wintering

- Stimulatory feeding during spring as a stimulus to rear more brood
- When new colonies or new queens are being prepared
- During drought and even before honey flow when colonies are very strong and they may have exhausted their food stores.

What is the best food? : Honey is the best food for bees. To substitute honey stores, sugar in different forms (as syrup, dry or candy) can be fed to the needy colonies.

Feeding methods:

Honey bees collect surplus food in the form of nectar and pollen when bee forage is available in plenty. Nectar is converted in to honey and stored for future use when there is dearth of flora. Similarly pollen is processed to form bee bread for later use to meet protein requirement of the colony. But with commercial interests in mind different hive products are harvested from bee colonies which need to be supplemented for their survival. Colonies are fed sugar in different forms to supplement honey and pollen substitute or supplement in place of pollen. Therefore, it is important to know method of preparation of different types of feeds given to bee colonies and methods of feeding.

Requirements

- Table sugar
- Glucose
- Water
- Tartaric acid
- Fat free soy flour
- Wheat flour
- Brewers' yeast
- Butter paper
- Different types of feeders (friction pail, division board feeder)

Procedure: Sugar is fed to bees by preparing syrup of different concentration depending on the season. Sugar is fed even in dry form or in the form of candy.

Preparation of sugar syrup:

- For general feeding, prepare syrup of 1 part of sugar and 1 part water (by volume), say one cup sugar and one cup water
- For preparing stimulatory feeding make dilute syrup by mixing 1 part sugar with 2 parts water
- Feeding during autumn/winter should be with concentrated sugar syrup. To prepare heavy sugar feeding, dissolve 2 parts of sugar in 1 part of boiling water and add 1 tablespoon full of tartaric acid to 50kg of sugar, so as to prevent crystallization of sugar from the syrup on cooling.

Feeding method:

- Feed the sugar syrup prepared using friction pail feeders and division board feeders
- Friction pail feeder can be any container of 2 to 3 litre capacity (may be wide mouthed bottle or can) with 4 to 5 small holes made by nail in the lid. Place (after filling with syrup and putting the lid tight) on the side of brood chamber with lid inverted on the bottom board if space is available. Otherwise place on top bars and put an empty super to cover it (Fig. 12.1 and 12.2). Place 2-3 small pebbles below the lid so that bees have sufficient space to feed on drops of syrup which comes out when bees are feeding through the holes

- Division board feeder is of the shape of frame having sufficient capacity for 2-3 litre syrup. Fill it with syrup. A wooden float in the feeder provides surface for bees landing and take up syrup by sitting on it. This feeder is placed on the extreme side of the hive where space is available
- The syrup can also be fed by filling in empty combs. Giving these to the needy colonies
- Some beekeepers use community feeder in the bee yard by placing syrup in open in a large capacity tank and bees take syrup from it. But this should be discouraged as it may initiate robbing and weak colonies are victim of this type of feeding.
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Figure 12.1 Feeder kept over top bars of brood frames by providing space for bees using 2-3 pebbles.



Figure 12.2 Feeder covered with empty super.

Dry sugar feeding: Dry sugar can also be fed to the colonies. Sugar can be provided on the inner cover with its hole open.

Preparation of sugar candy:

- Dissolve 7.5kg cane sugar (table sugar) and 1.5kg glucose in four cups of water by stirring and boiling mixture until temperature of syrup rises to 116°C
- Let the syrup cool to 82°C and then beat until thick
- Pour the candy in to mould lined with wax paper and let it cool
- Candy is ready to be fed to the colonies.

Feeding method: Place cake of sugar candy on small strips of wood above cluster of bees and place an empty super hive over the hive body.

Precautions:

- Feeding of colonies requires special attention of the beekeeper. Take all the steps to prevent robbing. Avoid spillage near the bee colonies and feed the colonies in the evening
- Type of feeding given to bees depends on season and give the recommended type of feeding e.g. heavy sugar feeding in autumn and winter when the colonies do not have sufficient stores for wintering. Dilute stimulatory feeding during spring as a stimulus to rear more brood. Dry sugar is to be fed during monsoon and sugar candy in winter when food stores fall (avoid feeding sugar syrup during winter to prevent initiation of brood rearing).

Pollen substitute and pollen supplement:

In addition to honey, bees also need pollen to meet their protein requirements and rearing of brood. If pollen stores are not sufficient and fresh pollen is not available, colonies can be given pollen substitute/pollen supplement.

Pollen substitute: This is a food to supplement pollen stores to which no pollen is added.

- Mix defatted soy flour (DSF) and wheat flour in equal parts by weight (say 150 g each)
- To three parts of this mixture add one part (100g) of deactivated yeast (killed at 60°C for half an hour)
- Mix with equal amount of heavy sugar (400ml) prepared by mixing 2 parts of sugar in 1 part of hot water
- Keep the kneaded pollen substitute overnight for proper penetration of sugar in the mixture
- To make the feed more attractive to bees, add 20 ml “dark rum” to 400 g of substitute before feeding
- Fill 400g of this substitute in the frame and give one frame each to needy colony using frame feeding method (Fig. 12.3)
- Also try feeding this substitute by wrapping it in butter paper and placing on top bars after making few punctures in the butter paper (Fig. 12.4).



Figure 12.3 Pollen substitute patty wrapped in butter paper and top bar feeding method



Figure 12.4 Frame feeding method of pollen substitute

Pollen supplement: Pollen supplement in addition to other components also contains pollen. It is readily accepted by bees.

Preparation of pollen supplement: To prepare pollen supplement mix 1 part of pollen in 3 parts of fat free soy flour and 2 parts of sugar syrup (prepared by dissolving 2 parts of sugar in 1 part of hot water). This is fed to the bees in a similar manner as described for pollen substitute.

Precaution: Pollen substitute or supplement should be fed only during dearth period when pollen is not available or during spring when colony demand for pollen is more for brood rearing as compared to available pollen.

6. Shifting of bee colonies:

- If colonies are to be moved within the apiary to a short distance, these should be moved 1 metre every day in the evening to the desired site
- If colonies are to be moved to a few hundred metres in the apiary, then these should first be taken to a distance of about 5km beyond the flight range. Keep the colonies for 2-3 days, and then bring back to the apiary and place at the desired site. However, before moving the colonies, all movable parts are nailed and colonies are closed in the late evening after the bee activity has ceased.

7. Queen management:

Qualities of a good queen:

- Good young mated queen (Fig. 12.5), has a gently tapering large abdomen full along the sides as compared to failing old queen (Fig. 12.7). Unmated queen is small in size (Fig. 12.6)
- Evenly coloured and large thorax
- Good egg laying capacity; lays single egg in the exact centre of the cell bottom which are slanted in the same direction (Fig. 12.8). In failing queen, there is uncontrolled egg laying and resultant brood is patchy (Fig. 12.9). Laying workers on the other hand lay many eggs in each cell (Fig. 12.10)
- Eggs are laid symmetrically, starting above the centre of combs and spreading out in all directions
- Combs are well occupied with concentric circle of brood of identical age.



Fig. 12.5 Good queen



Fig. 12.6 Unmated queen



Fig. 12.7 Old failing queen

Queen can also be judged from the behaviour of its progeny:

- Good honey producer.
- Less swarming instinct of the colony.

- Workers gentle in temperament.

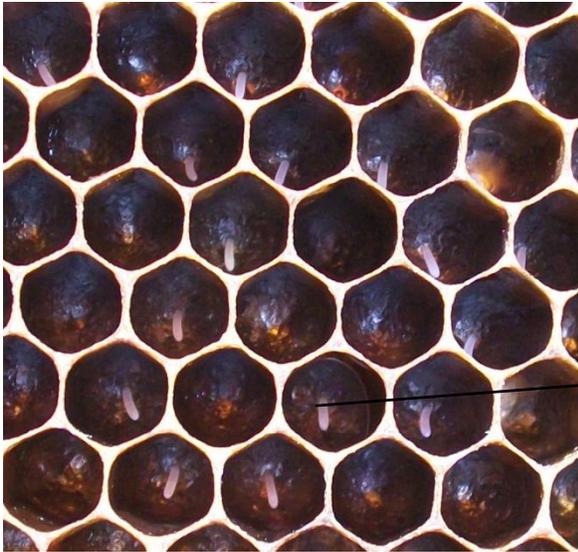


Figure 12.8 Eggs laid by a good queen

Single Egg



Figure 12.9: Failing queen and patchy brood pattern: Observe uncontrolled laying

Egg

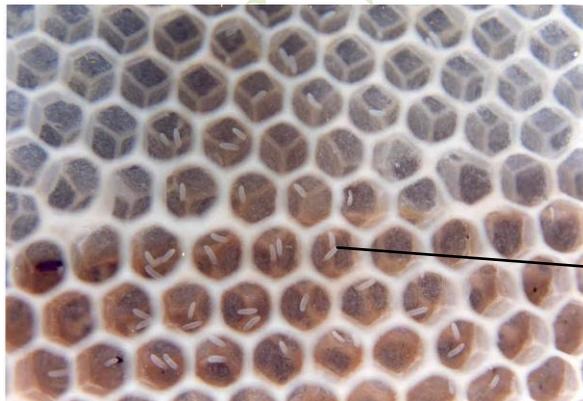


Figure 12.10 Multiple egg laying by laying workers

Eggs

When to replace the queen? Replace the poor queen whenever it is found (not on yearly basis), if reserve queens are available. Otherwise replace poor queen either during early spring or during fall.

Re-queening/Queen introduction:

- To introduce a queen in a queen less colony, it is caged along with 5-10 attendant workers in a queen cage and is suspended in between the frames. The queen is released after one day.
- Young queens can easily be introduced during a nectar flow in spring or late in fall when egg laying is minimum.
- It is advised that a beekeeper should have some queens in the nucleus hives as reserve queens for replacing as and when need arises (at least 10 queens per 100 bee colonies).

Practical things to do:

Perform the following and write the steps:

- i. Divide the given bee colony
- ii. Unite two bee colonies using “Newspaper” method
- iii. Observe robbing bees in the apiary from their behaviour
- iv. Prepare 30, 50 and 70 per cent sugar syrup and feed the colonies using friction pail feeders, division board feeders and frames
- v. Shift one colony 2 metres away from its present position and observe what happens
- vi. Check the quality of queen and comment whether it is good or of poor quality
- vii. Introduce the given queen in a queen less colony using a queen cage.
- viii. Prepare pollen substitute and give it to the colonies for feeding.