

Monsoon Management of Apiary

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Monsoon is very hard period for bees because of scarce availability of bee flora, continuous rains/cloudy weather, bees consumes their stores

Problems in rainy/monsoon season:

- Due to continuous rains and cloudy weather and scarce availability of bee flora in monsoon, bees are unable to forage and start consuming whatever store is possessed by the colony.
- Hot and humid conditions during monsoon further aggravate the conditions forcing the bees in a colony to make barbet (hanging down in a cluster at the alighting board). The high humid conditions invite many pests and diseases in the colony.
- Due to the scarcity of the food, egg laying by the queen is either diminished or altogether ceased, till the favorable conditions prevail. This further dwindles the colonies' bee strength. Such weak colonies are rendered prone to bee enemies like wax moth, wasps/hornets, black ants, bee eating birds etc.
- Initiations of robbing and queenless colonies are the two other serious bee management problems faced by the apiarists in this season.
- Infact monsoon is the most important period when bee colonies require intervention of the beekeepers for their perpetuation to the ensuing favorable season of autumn. The growth, development and performance of the colonies in the post-monsoon period much depends upon the management of honey bee colonies during the monsoon season.

Bee Management during Monsoon Season

1. Maintain hygiene and increase exposure to sun:

- Pollen and bees wax debris laying on the floor (bottom) board of the honey bee colony harbour the hibernating wax moth (both lesser and greater wax moth spp.) larvae. Clean the bottom boards collect the debris lying on it and burry it deep or burn it.
- Exposing the floor-boards for some time to sun during noon hours also helps killing the hibernating wax moth larvae concealed in the cracks and crevices.
- Keep the surrounding of the colonies clean by cutting the unwanted vegetation which may hamper free circulation of the air.

2. Artificial sugar/pollen feeding to the bee colonies:

- If the nectar / honey stores are less than 5 kg in the honey bee colony. Provide artificial feeding to bees colony,





preferably in the form of candy or by sugar syrup sugar and water solution / syrup (1:1) filled in division board feeders.

- Different methods of sugar feeding can be used: placing one kg sugar syrup filled tins/mugs/disposable glasses having some sort of floats (or wooden sticks etc.) for bees to sit on for imbibing the syrup; placing a wide mouthed sugar syrup filled bottle (having one or two minute holes in the lid) in an inverted position on top bars of bee frames/combs; placing suitable sized, syrup filled polythene bags as such, on the top bars of bee combs, each punched at 4-6 places with a paper pin/ needle and concealed inside the supper chamber to check robbing; directly filling the syrup in the empty bee combs.

- Never resort to mass feeding of sugar

syrup in open as it aggravates the robbing menace. Placing sugar crystals spreads bee diseases and mites because a good chunk of mass-provisioned feed would be taken up by wild honeybees and hive bees of the neighboring apiary, if any.

- Corbicular-pollen, already collected (trapped) during its abundant inflow and stored by the beekeeper or pollen supplement/substitute should also be fed to the colonies, as having scarcity of pollen stores, pollen feeding to bee colonies keep their morals high and continuation in optimum brood rearing activity. All the general precautions to check inter/intra-apiary robbing should be taken care of during supplementary feeding to the bee colonies.

3. Robbing and its management:

Robbing in the apiary may be intra-specific, during which workers of stronger colonies start robbing the food from the weaker colonies of the same species, or may be inter-specific during which worker bees of one species rob colonies of other species. During rainy season, this menace becomes more serious because of scanty availability of nectar in the field, leading to general weakening of honey bee colonies. Robbing can be identified from the bee fight taking place between the robbers and the guard bees at the entrance of the colony being robbed. The intruders try to kill the queen bee so that the colony inhabitants get demoralized and surrender themselves completely to the robbers. To take care of this menace the following preventive and curative measures should be followed:

i) Preventing robbing :

- The hives should be made bee proof, leaving the main entrance, plug all other cracks and crevices using mud etc. to check the robber's side entry into the colony.
- The main entrance of the colony should also be narrowed down to single bee space so that only one bee enters or leaves the hive at a time.
- Preferable time for the feeding of the bees should be late evening hours, when the bee activity ceases and all the workers are present inside the hive. Care should be taken that during this process the sugar syrup does not get spilt over the hive and the ground in the apiary premises etc. This can invite the robbers.

ii) Checking of robbing :

- In case robbing starts in the apiary, following points would help to check it:

- The main principle in checking the robbing is to reduce the entrance to the hive to the minimum so that robbers can't enter. The entrance of all the colonies should be reduced to one bee space and care must be taken that the hive is sufficiently ventilated to avoid suffocation.
- A bunch of grass etc. soaked in crude carbolic acid, kerosene oil or phenol should be placed in front of the entrance of the colony being robbed. Alternatively a slanting wooden plank should be adjusted in front of the hive entrance also deters the entry of the robbers. In case of heavy robbing, the entrance of colony being robbed be closed with wire guage and solution of carbolic acid should be sprinkled around it so that the robbers get repelled from the colony.
- After taking all the measures, if the robbing does not stop, the robber colony should be spotted out, should be dusted with wheat flour or sulphur powder over the bees at the entrance of the colony being robbed. This flour or sulphur will get dusted on the body of the robbers also. Such robbers can then be followed to locate their colonies/hives and as a last resort the robber-colony should be removed about 3 km away from the apiary or its site / place should be exchanged with the colony being robbed.

4. Queenlessness and worker layers:

Another major problem in honey bee colony during monsoon season is losing the functional queen bee due to one reason or the other and becoming queenless. Such colony tends to build queen cells provided the eggs or young larvae (less than 24-48 hours) are present in the colony. The presence of queen cells anywhere in the middle of the combs rather than on the margins might be one sign of missing queen bee. The queenless colony is easily differentiated from a queen-right colony:

i) Identification of queenless & laying worker colony:

The queen-less colony becomes more aggressive than the queen-right one. A little care on the part of a beekeeper will certainly go a long way in minimizing the queen losses. At routine examination of the colony, the bee combs with queen bee should be least disturbed and in no case be taken out and placed outside the hive.

- While examining the frames they should be held as, the frame should always be over the hive body and should not be taken away from hive body, so that if due to any reason queen bee falls, it will drop into the colony.
- Preferably, first spotting the queen bee from such frames and putting them near the last frame, will avoid crushing of queen bee in between the combs while placing the combs back into the colony. Similar care needs to be given to the queen bee while taking out honey frames and removing bees from them.
- There are the chances that queen bee got damaged during transportation of colonies during the dearth period. The bee hive length should be placed perpendicular to the length axis of the vehicle with shockers (trucks/four wheelers etc.) along the width of the vehicle.
- There are the chances of damage to the colonies which have plenteous amount of stored honey; therefore transportation of such type of colonies should be avoided. In case such colonies need shifting, the operation should be performed with utmost care and shifting should be done during night.
- Some honey bee enemies which occasionally are also the cause of colonies queenless may be kept under check by following suitable methods for their control. The birds are especially the problem during the mating season of the new queens. They may be scared away by the use of tinsel tape or bird scarer.
- The pesticidal poisoning to bees which sometimes may cause the queenless condition should be prevented by using no insecticide near the colonies, using safer insecticides to the bees to avoid the direct exposure. Preferably insecticides safe to honey bees are used

if the crop is being visited by the honey bees and / or the colonies are lying nearby the fields. Dose, formulation and timing of pesticidal application need be given utmost care and consideration.

- Robbing should not be allowed to start in the apiary and measures should be taken for its prevention, and also for control in the initial stages if it starts at all.
- Efforts should also be made for prevention and capturing of swarms in the apiary to avoid queenlessness in the colonies.

ii) The Curative methods:

Despite the best efforts on the part of the beekeeper, some of the colonies still become queenless. Such colonies need special care for normalizing of the working. Handling of such colonies largely depends upon the stage of queenlessness and the season of the year.

- In case the queenlessness occurs during the active breeding season, the colony managed itself by raising the new queen bee cells and by giving the nourishment to young worker larvae or eggs, the new queen raised get mated in due course and start laying eggs.
- If due to some reason, the queen raised is not able to mate, a new frame is added with eggs and young worker cells for raising new queen cells. The process can further be hastened by adding the new queen cells. It should be noted that provision of eggs, young larvae or gyne-cells (would be queen cell) can be undertaken only when there is breeding season and there is good drone population for successful mating of newly emerged queen bee.
- If the beekeeper has a spare stock of nucleus queens or it can be managed by a quality queen breeding beekeeper, for use in emergency, he should make use of them for getting his colonies requeened. It is the best option since it will save time, otherwise time would be wasted in raising new queen cells and colony strength will keep on building up which definitely avoids any loss to colony productivity. Thus, as far as possible the beekeeper should maintain a queen bee bank of quality stock.
- Alternatively, the queenless colony should be united with queen-right colony if that happens to be some good honey flow period. This would rather augment the honey production.

iii) Management of laying worker colonies:

Sometime the queenless conditions of the colony continue for a longer duration. This happens owing to two main reasons i.e. the lack of timely management of the queenless colony by the beekeeper and the unfavourable season for queen production. Generally this stage is reached after almost all the larval and pupal brood of the previous queen bee has emerged. The handling of such colonies becomes nevertheless more important and quite often baffles even the experienced beekeepers.

The first step in handling these colonies is to get rid of the laying worker bees so that it becomes easy for the colony to accept any help rendered by the beekeeper. The most effective, feasible and practicable method of doing away with the laying workers is to shake the bees from all the bee frames/ combs a few meters away in front of the hive. The normal worker bees will fly back to the hive, whereas the laying worker bees which are heavier and unable to fly back do not return to the hive. With this method, we will be successful to a great extent in eliminating the laying worker bees from such a colony.

The second step is getting rid of the drone brood of laying worker bees present in worker cells of the frames. For this, the raised sealed laying worker brood should be scrapped off with hive tool or their cell cappings destroyed with uncapping Varroa comb. Alternatively, all the frames containing eggs or other stages of the brood should be replaced with the brood frames from the stronger queen-right colonies. Normal brood frames will build-up morale of the colony such that further efforts for its requeening will be easier. This discourages the urge of egg laying by the laying worker bees, if any left. After these

preliminaries are over, the following methods to be used for normalizing the laying worker colonies.

- i) **Giving eggs:** This method can be adopted only if it is a breeding season and sufficient drone brood rearing in the apiary is underway. Some beekeepers give the comb frame containing fresh eggs (Fig 5) as usual practice to the laying worker colonies. This practice invariably results in failure of raising the normal queen cells. This is because of the reason that nurse bees are required to feed the freshly hatched larvae to raise them into gynes. It is, therefore, recommended that while giving a comb with eggs to laying worker colonies, sufficient number of nurse bees from another colonies be also given for ensuring queen cell raising. For this frames of unsealed brood with more bees on them from normal colonies can be shaken to dislodge the nurse bees into laying worker colony or alternatively, frames of emerging sealed brood from normal queen-right colonies may be provided.
- ii) **Transplanting queen cells:** This method is preferred over the former as it reduces the broodless period. This method is also followed only during brood rearing season. This method is based on the method, where the gyne cell from other hive is taken from other hive and transplanted in the queenless hive (Fig 6) to avoid the lengthy process of giving eggs and having the queen cells raised. Only problem with this method is the fact that colony hesitate to accept the given queen cell by the bees. To overcome this problem, the queen cell after grafting may be protected with a queen cell protector. The protector should be removed after acceptance of the cell but before the emergence of the queen. In other seasons/ unfavorable conditions when sufficient drones or drone brood is not available in the apiary, the mating of the virgin queen does not take place and the colonies would still remain queenless. Under such conditions the methods mentioned below may be followed :
- iii) **Queening:** This is the method which is based on standard queen bee introduction method by using of queen introduction cage. The best practice to be followed for the managing the queenless colonies as this would totally avoid any subsequent broodless period. This method is useful only under the situations where even after the shedding off the laying workers from the colony, sufficient number of normal bees remain behind which may be exploited by giving a mated and laying queen from some other source / queen bee reserve. Generally the laying worker colony shows reluctance in accepting the new queen bee also.

5. Uniting laying worker colonies: This is the last resort to be followed for the most hopeless colonies when the spare mated and laying queen bees are not available. The laying worker colonies may preferably be united with the stronger queen-right colonies using news paper or any other standard / recommended method. The stronger colony should be used because it would be able to clean and eliminate the brood of the laying worker colony more conveniently and efficiently, that is not possible with weaker colony, as the chances are there that the laying worker bees may even kill the queen of the other queen-right colony, or otherwise the laying worker colony may also be united with two or more queen-right colonies. Care should be taken in this regard, as proper procedure is not followed for uniting the colonies, beekeeper can face the problem of losing queen-right colony. Otherwise this is the best option if number of colonies in the apiary is not concerned and wisdom prevails to increase the apiary production.