

**APICULTURE AND AQUACULTURE WEEK 4: APIARY SITE SELECTION
AND HIVE MANAGEMENT – EXTERNAL ANATOMY: HEAD, THORAX
AND ABDOMEN**

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Definition of an Apiary

This is a place where a number of bee hives are kept.

Factors to consider when siting an apiary

1. Distance from water source; place the hives near reliable water source like rivers or permanent streams or provide water in the apiary for the bees.
2. Proximity to flowering plant; this ensures supply of pollen and nectar to bees as food.
3. Wind direction; the hives should be sheltered from strong winds with hedgers.
4. Overhead sun; the place should be shady as too much sunshine causes over heating in the hives.

Factors to consider when siting an apiary

5. Noise; Site the apiary away from noisy, public places e.g. road sides, commercial centers etc. to avoid disturbance from humans.
6. Sources of pollution; for example smoke from fire makes the bees uncomfortable.
7. Distance from homesteads; it should be at least 100m away from home dwellings to avoid human interference and aggressive behaviour of bees.
8. Distance from animals and grazing areas; to avoid interference from animals that may enter apiary and provoke the bees to strike.
9. Accessibility; should be near good road networks to ease access.

The features of a good site for an apiary

- Should be at least 100-200m away from human dwellings.
- Should be quiet and away from public places to avoid noise.
- Should be near a reliable water source.
- Should be near food source such as flowering plants.
- Sheltered from strong winds.
- Sheltered from strong sunshine.

The features of a good site for an apiary continue ...

- Away from swampy or marshy areas with stagnant water. Humid areas encourage fungal infections and prevent honey maturity.
- Away from farm animals and grazing areas.
- Have good accessibility with good roads on the leeward sides.
- Away from smoke and fire.

Routine apiary management practices continue

- ✓ Regular hive inspection; to control mice and wasps that may reside in the hives and keep of swarm.
- ✓ Regular cleaning; to avoid buildup of dirt in the hive.
- ✓ Provision of water during the dry seasons.
- ✓ Provision of security; by fencing the apiary.
- ✓ Provision of shade to the hives; to avoid excessive heat from the sun.

Routine apiary management practices continue

- ✓ Provision of foraging plants; to ensure supply of pollen and nectar to bees by growing crops like sunflower, mangoes, avocado and citrus around the apiary.
- ✓ Swarm control; by providing proper conditions in the hives e.g. ventilation.
- ✓ Colony division and unification; to ensure restocking of empty hives and increase productivity.
- ✓ Annual re-queening; to ensure efficiency and productivity of the colony.

Routine apiary management practices continue

- ✓ Supplementary feeding; during prolonged dry seasons by providing sugar syrups.
- ✓ Record keeping; to ease management practices e.g. inspection.
- ✓ Harvesting, processing and selling of honey at the end of the production season.

Colony division

- This is the splitting of colonies already in apiary and transferring the brood with the queen to a new hive.
- It can be done to increase apiary size and production.
- This can be done after honey flow or when the bees are getting ready to swarm, signaled by presence of queen cells usually at the bottom of the comb.

Procedure of dividing a colony

- Select a productive, less aggressive colony with brood, eggs, pollen and nectar.
- Prepare the new empty hive and necessary equipment.
- Smoke the colonized hive and select a comb with queen cells.
- Transfer the comb with the old queen into the new hive, leaving the developing queen cell in the old hive.

Procedure of dividing a colony continues

- The old queen will lay eggs the same day to replenish her losses.
- Also, transfer one or two combs with brood, honey and pollen.
- Put the brood comb in the middle and honey combs on the either sides to insulate the brood nests.
- Brush all bees on the transferred comb into the new hive.

Procedure of dividing a colony continues

- Move the new hive to a site at least 10m from the old site; to ensure that the returning bees go into the old and others into the new hive.
- Provide sugar syrup to the bees in the new hive.
- A new queen will hatch out in the old hive and become the reigning queen.

Uniting a colony

- This involves bringing together of smaller bee colonies to form one large and more productive colony.

Procedure of uniting a colony

- ❑ Choose the colonies to unite.
- ❑ Smoke both hives thoroughly so that their familiar smells are covered.
- ❑ Also, dust the bees with flour or spray them with sugar syrup to make them busy cleaning themselves.

Procedure of uniting a colony continues

- ❑ Transfer all the top bars with combs and bees together into one hive.
- ❑ Alternate combs from different colonies, ensuring that the brood combs are in the middle of the other combs.
- ❑ Close the hive and leave the united colony undisturbed for the next few days.

Re-queening

- This is a practice of introducing a young queen in an old colony to replace the old and unproductive queen.
- The strength of a colony depends on the age of the queen i.e. the younger the queen, the more active she is and the more eggs she will lay enlarging the colony and increasing honey and other products.
- In order to maintain the strength of the colony, re-queening every 2-3 years is recommended.

Benefits of re-queening

- ✓ It improves the strength of the colony by increasing the size.
- ✓ It increases the productivity of the bee hive due to increase in the number of foragers.
- ✓ It helps to control swarming in bees.
- ✓ It prevents absconding of bee hives.
- ✓ Addressing aging or failing queens.
- ✓ managing undesirable traits in the colony

Methods of re-queening in apiary management:

1. Direct Introduction:

- . This is the simplest method where the new queen is directly introduced into the hive.
- . The existing queen is typically removed, and the new queen is released directly into the hive.
- . Care must be taken to ensure that the worker bees accept the new queen. Sometimes, a slow-release cage is used to allow gradual acceptance.

Methods of re-queening in apiary management continue

2. Caged Queen Introduction method:

- . A common method involves placing the new queen in a small cage with candy or a plug at one end.
- . The cage is then placed in the hive, allowing the worker bees to gradually release the queen by eating through the candy or removing the plug.

Methods of re-queening in apiary management continue

3. Push-in Cage Method:

- . This method involves placing a queen in a cage with a candy plug between two frames.
- . The cage is "pushed in" between the frames so that the worker bees have direct contact with the queen through the cage.
- . This allows the workers to become familiar with the new queen's pheromones before her release.

Methods of re-queening in apiary management continue

4. Combining Colonies:

- . Combining two colonies involves merging the workers of a weaker colony with those of a stronger colony.
- . During this process, the weaker colony's queen is usually removed, and the stronger colony adopts the new queen.
- . This method is often used when a colony is too weak to thrive on its own.

Methods of re-queening in apiary management continue

5. Artificial Swarm Method:

- . This method simulates a swarm by creating a temporary separation between the queen and part of the worker population (Brown, 2021).
- . The queen is moved to a new hive or a queenless section of the hive, and the original hive raises a new queen from eggs or larvae.

Methods of re-queening in apiary management continue

6. Queen Banking:

- . In queen banking, a surplus of queens is raised and stored in cages for future use.
- . When re-queening is necessary, a queen from the "bank" is introduced to the hive.

Methods of re-queening in apiary management continue

7. Demaree Method:

- . Developed by beekeeper George Demaree, this method involves separating the brood chamber from the honey chamber with a queen excluder.
- . The existing queen remains in the honey chamber, while the brood chamber raises a new queen. After the new queen is mated and laying, the colonies are recombined.

NOTE: When re-queening, it's essential to consider the timing, the condition of the existing queen, and the acceptance of the new queen by the worker bees to ensure a smooth transition and the continued health of the hive.

Communication of bees in a hive

- Bees communicate in two ways:

- a) By use of physical stimuli (bee dances).**

- b) By means of chemical stimuli (bee pheromones).**

a) Bee dance

- Bee dance is used to communicate the source/direction, distance and quality of food.
- It is performed by foragers (worker bees) that return to the hive

Types of bee dance

i). Circular/Round dance: It is performed by the returning worker indicating that the source of food is near the hive usually less than 150m away.

ii). Waggle/Tail waggle dance: Performed by the returning bee indicating that the source of food is far from the hive in a distance of over 150m away.

- It is performed with three elements of communication;
- Direction in relation to the overhead sun; showing the angle to which the food is from the hive.
- Quality of food; shown by the speed of the dance.
- Distance away from the hive; shown by duration of the dance.

Chemical communication

- Chemical messengers known as pheromones are released by bees of all castes and are used to communicate to other bees. For example:
- To communicate location and scent of food.
- Communicate danger in the hive to trigger defensive actions.
- The queen releases pheromones to communicate need for mating.

References:

- Brown, T. H. (2021). Managing honeybee colonies through artificial swarm techniques. *Bee Science Journal*, 45(4), 78-85.
<https://doi.org/10.1007/s13592-021-00987-6>

- Thank you.
- We meet next week 5