

Beekeeping is a Side Business to Agriculture

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SUMMARY

Honey bees are important pollinators that play a crucial role in the ecosystem. They are known to forage on a wide variety of plants, but some plants are particularly well suited for honey bee forage. Honey bees play a critical role in India's ecosystem and agriculture. They are responsible for pollinating a variety of crop, including fruits, vegetables and nuts. Without honey bees, the productivity of these crops would decrease significantly, leading to a decrease in food security and an increase in the cost of food. Honey bees also have a direct economic impact on the country. Honey and beeswax production in India is a significant source of income for many rural communities. In addition, honey bees play a vital role in the pollination of plants that produce seeds, which are used for planting the next crop. This helps to ensure food security and sustainable agricultural practices.

INTRODUCTION

Due to several uncertainties connected with agriculture farmers have to rely on some kind of side business associated with agriculture to earn more profit. Honeybees naturally collect pollens and nectar & convert them into a fine edible, nutritious, and healthy product for human beings – Honey. They are very helpful to the farming community as they do pollination in crops free of cost. We also get several other by products from beekeeping like Royal Jelly, pollens, beeswax, bee venom, propolis, etc. Honeybees help the farming communities on large scale by pollinating flowers and causing pollination. Bees play an important role in pollination of fruits and vegetable crops. This results in a huge increase in production by 25 to 35%. Since there is scope for employment generation, if this industry is made as a supplementary industry, the unemployed youth of the rural areas can get good employment. Hence beekeeping or Apiculture can benefit the farming community on large scale, so farmers should go for this supplementary agricultural business to earn handsome profits.

Uses of the honey bee:

- In addition to providing man with very valuable materials as honey and beeswax, the honey bees are also useful to him in aiding in the pollination of many of his crops.
- In fact, it has been claimed that the value of bees in the pollination of crops is ten to twenty times the value of honey and wax they produce.
- Certain crops like apples, alfalfa, and clover almost entirely depend upon bees for their pollination.
- Even among some regularly self-pollinated crops, the yield is considerably increased after the visit of bees.

What is Beekeeping? :

'Beekeeping' also called 'apiculture' is the maintenance and management of honey bee colonies, usually using man-made hives.

Benefits:

- This business is very important to preserve the natural wealth by maintaining the balance of the environment.
- Pollination by bees increases yield in many crops.
- Along with honey, wax is also produced.
- Honey and beeswax are used to make cosmetics, many types of medicines.
- This provides employment at the village level at low cost.
- Beekeeping does not compete with agriculture, orchards, vegetable cultivation and any ancillary industries.
- There is no need for capital investment such as space, electricity, vehicle, building, etc.

Important for successful beekeeping:

- Choose the right species of bees for beekeeping.

- Plants that yield pollen and nectar to bees are called bee pasturage and florage. Such plants should be plenty around the apiary site.
- Must have knowledge regarding techniques required for beekeeping.
- It is necessary to know the technology of handling bee hives and honey extractor.
- A good quality of honey is must necessary.
- There should be market availability nearby for selling honey and beeswax. Purchases as required through management.
- Bees should be transported in the evening or at night.
- The boxes should be preferably place in an area which is free of electrical wires.



Species of bees:

Among these bees, Indian bees and European bees can be kept in boxes.

Indian bees (*Apis cerena indica*)

European bees (*Apis mellifera*)

Rock bee (*Apis dorsata*)

Small bee (*Apis florea*)

Equipment Needed for Beekeeping :

Hives :

- The hive is the man-made structure used by beekeepers for keeping honey bees.
- It is usually made of wood; however, it can also be made of plastic, polystyrene, or any other material.

Frames :

- Frames are of rectangles shapes that hang within a hive-like filing system.
- The honey bees will construct their comb within these frames. This is the place they will make honey, lay brood, and live their lives continually planning for winter.

Protective clothing:

Bee veil : Bee veil is the most important equipment for beekeepers. He wears it over the head to protect his face and neck from the stings of bees while taking honey or inspecting the hive.

A beekeeper should wear a bee veil consistently to shield his face and neck from stings. Three basic types of veils are available in the market. First are those that are open at the top to fit over a hat, second is totally hatless veils, and third are veils that form part of a honey bee suit.

Bee Suit : A wide variety of bee suits are available in the market for beekeepers in a wide price range. White or tan clothing is most suitable when dealing with honey bees. Different colours are also worthy, but honey bees respond adversely to the dark hues, fluffy materials, and garments made from animal fibre.

Gloves : Gloves are another essential and inexpensive tool for beekeeping. It protects your hands from bee stings. Without wearing gloves one can't even imagine touching the hive. So while purchasing gloves make sure that the gloves should be made of sturdy material.

Shoes : Shoes are also an important part of beekeeping. It is necessary to cover yourself properly from top to bottom before digging the hive. So the beekeeper needs to wear boots that should belong in the leg, are easy to tuck in the bee suit, made of hard material with strong soles too.

Smoker : The bee smoker is an essential piece of a beekeeper's toolbox. Without the smoker, beekeepers would endure a lot more stings during a hive investigation. These simply designed smokers are used to calm bees when the beekeeper has to work in the hive. The smoke produced by the smoker persuades honey bees that their hive is on fire.

Hive tool : A hive tool is also an essential, low-priced, and multipurpose tool that is used in maintaining and investigating apiaries. It is available in different variations and styles. It is considered as the third most necessary tool for the beekeeper after the beekeeping veil and bee smoker.

Queen Catcher: A queen catcher is a handy and convenient tool used to separate the queen for a while from the bee crowd.

Feeders : A feeder is a vessel or apparatus used by beekeepers to feed pollen, honey, or substitutes like a mixture of sugar and water to the honey bees of a colony. In some of the seasons when things either have stopped sprouting or are standing by to blossom. At this time your honey bees will require you to assist them with enhancing their food supply.

Bee Brush : Bee brushes are used to separate the bees from the honey frames. After evacuating the frame, shake it to unstick the majority of the bees and afterward use the bee brush delicately, and brush over the rest of the honey bees from the frame.

Honey extractor : This equipment consists of a cylindrical drum containing a rack or box inside to hold the super frames. The box is fixed to a rod at the centre and it can be rotated by a set of two gear wheels. The frames with honey cells are decapped by a sharp knife after dipping it in hot water and fixed to the slots provided in the box which is rotated by the handle.

Bee pasturage or bee forage :

- Plants that yield pollen and nectar are collectively called 'bee pasturage' or 'bee forage'.
- Honeybees visit flowers for two purposes to collect pollen, which is used to feed the brood and to collect nectar that can be turned into honey to feed the colony over winter.

- There are lots of flowers to grow to attract honeybees, but worker bees show a preference for flowers that give them the highest pollen and nectar rewards.
- Plants which are good source of nectar are tamarind, moringa, neem, *Prosopis juliflora*, *Soapnut tree*, *Glyricidia maculata*, *eucalyptus*, *Tribulus terrestris* and pungam.
- Plants which are good source of pollen are sorghum, sweet potato, maize, and tobacco, millets like ragi, coconut, roses, castor, pomegranate and date palm.
- Plants which are good source of both pollen and nectar are banana, peach, citrus, guava, apple, Sunflower, berries, safflower, pear, mango and plum.
- If plants such as Drumstick, Ritha, Nilgiri, Sawar are planted, the bees get food supply throughout the year.
- Beekeeping benefits if corn is planted in a field so that it is almost always in bloom.

Crops that benefits from pollination :

Vegetables: Onion, Cabbage, Radish, Drumstick, Ridge gourd, Bitter gourd, Cucumber, Pumpkin, Carrot etc.

Fruits: Pomegranate, Orange, Guava, Strawberry, Cashew nut, Coconut, Lemon etc.

Flowers: Crysanthemum, Marigold, Hollyhock, Aster etc.

Crops: Mustard, Sunflower etc.

Effect of bee pollination on crop :

- It increases yield in terms of seed yield and fruit yield in many crops.
- It improves quality of fruits and seeds.
- Bee pollination increases oil content of seeds in sunflower.
- Bee pollination is a must in some self-incompatible crops for seed set.

Time to keep the Bee Hives:

- Boxes should be placed in the field after 5 to 10 percent flowering in orchard and fruit and vegetable crops.
- Approximately 3 Indian beehives or 2 European beehives should be kept for one hectare of crop.

Management of Colonies:

- Beehives should be checked at least twice a week during the honey season, preferably in the morning.
- Proper hygiene of the hive must be maintained. The colony should be monitored regularly to check the number and growth of bees.
- While keeping the bee box, keep a bowl full of water under all four legs. So that ants should not get enter to the box.

Management of colonies during dearth period:

- 'Dearth' is any period of time when no significant amount of nectar is coming into your hives because no notable nectar-producing plants in the area are blooming.
- A dearth (an absence) of nectar means that your hungry bees will have to eat stored honey or syrup from a feeder to sustain them.
- The older bees should be removed and the younger bees should be properly settled in the brood chamber. Install partition board if required.
- Sugar syrup should be given at the rate of 200 grams of sugar per colony per week for Indian bees.
- All bee colonies should be fed at the same time.

Management of colonies during honey flow period:

- The 'honey flow' is defined as the period of availability of floral nectar that is suitable for bees to convert into honey. It is the total period during which honey bees collect nectar and pollen.
- Adequate numbers of bees should be kept in the colony. Don't allow overcrowding of bees.
- To keep the queen bee in the brood chamber, queen separation dummy sheets should be placed between the brood and super chambers and the colony should be inspected periodically.
- Frames full of honey should be removed from the side of the super. Fully enclosed combs should be taken out to extract the honey. After removing the honey, put it back in the super.
- The combs are ready to extract the honey that is completely filled with honey and light in colour. Honey should be removed from sealed combs.

Honey Extraction:

- The part of the hive from which the honey is to be extracted, remove the bees from the area and remove the hive frames.
- The frames are commonly placed into a centrifuge that spins the frames, forcing the honey out of the comb.
- The honey is spun to the sides of the extractor and then drains out the bottom into a collection vessel. The remaining wax can be pressed in a screw press to remove the remainder of the honey.
- Honey Store in a stainless steel container.

Protection from pesticides:

- Pesticides should be used only in appropriate places.
- In case of heavy infestation, spraying should be done after sunset.
- Use pesticides that do not harm bees.
- Do not spray near boxes. If possible, sacks should be placed over the boxes or boxes should be kept at least 2 to 3 m at a distance.
- Sugar syrup should be given to the bees during spraying.
- Care should be taken to ensure proper circulation of air in the box.

CONCLUSION

In the modern era, beekeeping is often used for crop pollination and the collection of by-products, such as wax and propolis. The largest beekeeping operations are agricultural businesses but many small beekeeping operations are run as a hobby. As beekeeping technology has advanced, beekeeping has become more accessible. Beekeeping provides rural people in developing countries with sources of income and nutrition. It is a sustainable form of agriculture, which is beneficial to the environment and provides economic reasons for the retention of native habitats and potentially both increased yield from food and forage crops. Complex processing methods are not required and the whole industry can be highly cost effective.

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