

## Apiculture for better economy return of the rural families

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### Abstract

Bees are type of social insect. They colonized in groups. They build their nest on tree branches or cornices and live in them. They are divided in three castes and their homogeneity is very clear. The worker bees build their nests by the bee wax secreted from their bodies and they collect the nectar of the flower and convert it into honey in their body. They store this converted honey in a wheelbarrow. But bees can be nestled in specially designed wooden boxes. The establishment of bee colonies in this type of box for the purpose of collecting honey and bee wax is called bee keeping or apiculture.

Keywords: Honey Bee, Honey, Wax, Extraction, colony, sugar

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### Introduction

Honey and beekeeping have a long history in India. Honey was the first sweet food tasted by the ancient Indian inhabiting rock shelters and forests. He hunted bee hives for this gift of god. India has some of the oldest records of beekeeping in the form of paintings by prehistoric man in the rock shelters. With the development of civilization, honey acquired a unique status in the lives of the ancient Indians. They regarded honey as a magical substance that controlled the fertility of women, cattle, as also their lands and crops. The recent past has witnessed a revival of the industry in the rich forest regions along the sub- Himalayan mountain ranges and the Western Ghats, where it has been practiced in its simplest form.

### Objectives

Initiating steps for quality honey production and other bee hive products for overseas and domestic markets besides enhancing productivity of various crops through bee pollination. Increasing the employment opportunity in rural sector and thus enhancing the ancillary income of the beekeepers & farmers.

### Significance

**Apiculture** is important because it provides bees with a safe place to work and live. Since bees pollinate many of our food sources, it's important to keep the bee population healthy. Additionally, **apiculture** provides an environment in which to study bee habitat and behavior

## Species of Honey bee

- **Rock bee** (*Apis dorsata*): They are good honey gatherers with an average yield of 50-80 kg per colony.
- **Little bee** (*Apis florea*): They are poor honey yielders and yield about 200-900 g of honey per colony.
- **Indian bee** (*Apis cerana indica*): They yield an average honey yield of 6-8 kg per colony per year.
- **European bee** [Italian bee] (*Apis mellifera*): The average production per colony is 25-40 kg.
- **Stingless bee** (*Trigona iridipennis*): They have poorly developed stings and are available in Kerala. They are efficient pollinators. They yield 300-400 g of honey per year.

## Production process

Honey bees can be raised in boxes at the farm or home.

**Equipment:** Hive, smoker, cloth, knife, feather, queen excluder, match box.

### Production bee:

- **Hive:** It is a simple long box covered with a number of slats on top. The rough measurements of the box should be around 100 cm of length, 45 cm of width and 25 cm in height. The box should be 2 cm thick and the hive must be glued and screwed together with entrance holes of 1 cm wide. The slats (top bars) must be as long as the hive is wide in order to fit across and the thickness of about 1.5 cm is sufficient to support a heavy honey comb. The width of 3.3 cm needs to be given to give the bees the natural spacing they need to easily build one comb to each separate top bar.
- **Smoker:** It is the second important piece of equipment. This can be made from a small tin. We use the smoker to protect ourselves from bee stings and to control the bees.
- **Cloth:** to protect our eyes and nose from stings at the time of work near the apiary.
- **Knife:** It is used to loosen the top bars and to cut off the honey bars.
- **Feather:** To sweep the bees from the comb.
- **Queen Excluder:** A queen excluder is a selective barrier inside the beehive that allows worker bees but not the larger queens and drones to traverse the barrier.
- **Match box**

### Establishment of hives:

- The apiary must be located in well-drained open area, preferably near orchards, with profuse source of nectar, pollen and water (Figure 1).
- Protection from sunlight is important in order to maintain an optimum temperature in the hive.
- Ant wells are fixed around the hive stand. The colonies must be directed towards east, with slight changes in the directions of the bee box as a protection from rain and sun.
- Keep the colonies away from the reach of cattle, other animal, busy roads and streetlights.

### **Establishing of bee colony:**

- To establish a bee colony, bees can be obtained by transferring a wild nesting colony to a hive or attract a passing swarm of bees to occupy it.
- Before putting a swarm or even a colony in a prepared hive, it would be beneficial to make the hive smell familiar by rubbing old brown comb pieces or some bee wax. If possible, the Queen bee can be captured from a natural swarm and placed under a hive to attract the other bees (Figure 2).
- Feed the hived swarm for a few weeks by diluting a half cup of white sugar in half a cup of 1560\hot water as this will also help in building the comb along with the bars rapidly.
- Avoid over crowding

### **Management of colonies:**

- Inspect the beehives at least once in a week during the honey-flow seasons preferably during the morning hours.
- Clean the hive in the following sequence, the roof, super/supers, brood chambers and floorboard.
- Observe the colonies regularly for the presence of healthy queen, brood development, storage of honey and pollen, presence of queen cells, bee strength and growth of drones.
- Look for the infestation by any of the following bee enemies.
- Wax moth (*Galleriamellonella*): Remove all the larvae and silken webbings from the combs, corners and crevices of bee box.
- Wax beetles (*Platybolium* sp.): Collect and destroy the adult beetles.
- Mites: Clean the frame and floorboard with cotton swabs moistened with freshly made potassium permanganate solution. Repeat until no mites are seen on the floorboard.
- Management during lean season.
- Remove the supers and arrange the available healthy broods compactly in the brood chamber.
- Provide division board, if necessary.
- Destroy queen cells and drone cells, if noted.
- Provide sugar syrup (1:1) @ 200 g sugar per colony per week for Indian bees.
- Feed all the colonies in the apiary at the same time to avoid robbing.
- Management during honey flow season.
- Keep the colony in sufficient strength before honey-flow season.
- Provide maximum space between the first super and the brood chamber and not above the first super.
- Place queen excluder sheets in between brood and super chamber to confine the queen to brood chamber.
- Examine the colony once in a week and frames full of honey should be removed to the sides of the super. The frames, which are three-fourth filled with honey or pollen and one-fourth with sealed brood should be taken out of brood chamber and in its place empty combs or frames with foundation is added.

- The combs, which are completely sealed, or two-third capped may be taken out for extraction of honey and returned to supers after honey extraction.

#### **Harvesting of honey:**

- Harvest the honey by smoking the bees off the parts which needs to be harvested and cut the combs carefully (Figure 3).
- Harvests are normally possible during and shortly after the two main flowering seasons, namely October/November and February-June.
- A ripe comb is light in colour and filled with honey. More than half of the honey cells on both the sides are sealed with wax.

#### **Economic aspect**

Beekeeping is one of the plans adopted by the Government of India and the state Government for rural economic development or rural self- reliance schemes.

Beekeeping does not require much capital. The labor on the cultivated land is comparatively very low. Moreover the amount of land required for this cultivation is so insignificant that it is possible to do this in the backyard, garden or any open balcony. On the other hand, there is a lot more profit to be made by selling honey and beewax.

Rural people, men and women alike, can wear honey in a scientific way by collecting honey from bee- boxes. Enthusiastic people can get science based training in beekeeping from khadi village industries sanctuary etc. or from sundarbans Bee Keepers Association, Baruipur Bee Keepers Association of west Bengal free of cost or for a small fee.

#### **Importance of apiculture**

- Provides honey, which is the most valuable nutritional food.
- Provides bee wax which is used in many industries, including cosmetics industries, polishing industries, pharmaceutical industries, etc.
- Plays an excellent role in pollination. Honey bees are the best pollinating agents which help in increasing the yield of several crops.
- According to the recent studies, the honey bee's venom contains a mixture of proteins which can potentially be used as a prophylactic to destroying the HIV that causes AIDS in humans.

The use of honey as food and in the pharmaceutical industry, as well as in religious ceremonies and in the manufacture of other objects, is widespread. Honey is a strong and vitamin rich enhancing tonic.

#### **Uses of Honey**

- Honey is used instead of sugar in the preparation of jam, jelly and syrup.
- Honey has been used since ancient times in the preparation of medicines. Honey is preferred for weak stomach.
- Honey is an essential ingredient in various religious ceremonies.

- Honey is used to make alcohol in western countries.

### Use of Beeswax

- It is used in lip balm, lip gloss, hand creams, salves and moisturizers.
- Beeswax also used in cosmetics such as eye shadow, blush and eye liner.
- Beeswax is also an important ingredient in moustache wax and hair pomades, which make hair, look sleek and shiny.

### Cost and profit for beekeeping

You can start beekeeping in just 225000 /- rupees only and you can start beekeeping in august to September .it is best for start the beekeeping because the cost of total investment recovering in this months.Unit cost of 80 no. of bee colonies

Non-recurring expenditure		
Sl. No	Types of expenditure	Cost
1.	Cost of 10 no. of beehives per box	2000*80 =160000/-
2.	Cost of 80 bee box	400 * 80 =32000/-
3.	Cost of apiary equipment (bee-veil, honey tent , bee-tool ,bee-brush)	5000/-
4.	Cost of honey units + uncapping tray	12500/-
5.	Bee wax sheet	350/- per kg

Recurring expenditure		
Sl. No	Types of return	Cost
1.	Man Skill Labors cost	5000*12 = 60000
2.	Man Unskilled cost	3500*12 =42000
3.	Migration charge	20000
4.	Feed charge annual	10000
	Total	132000

### RETURN

- Honey production 80 rupees \*40 kg = 3200Rs per Box
- Total return from honey production 3200Rs\*80Bee Box= Rs256000

Net profit = Return from Honey production – Expenditure = 256000 – 132000 = 124000/-

**NET PROFIT =124000/-**

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## Figures



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**Fig.1 Establishment of Bee hives 2. Bee keeping 3. Harvesting of Honey**