

FACTORS AFFECTING HONEY YEILD

Factors affecting honey yield:

- There are many biotic and abiotic factors which effects the honey yield and production including natural and anthropogenic factors.
- These factors also affects the bee health.
- Lowers the income.
- Effects the cost benefit ratio.

- There are following factors which badly reduce the honey production and yield:

1) Loss of Bee Colonies

- Loss of bee colonies due to absconding reduces the honey production and yield.
- Also reduce the income of the beekeepers.

Absconding:

- Absconding is the term used when a colony of **honey bees** leaves its home in search of another.
- It is due to some environmental factor.
- It causes loss of colony and results in the low production and yield of honey.



Swarming:

- Swarming is a honey bee colony's natural means of reproduction.
- In the process of swarming a single colony split into two or more distinct colonies
- Natural method of propagation that occur in response to crowding within the colony
- Usually occur in late spring and early summer and begin in warmer hour of the day
- Swarming also reducing honey yield

2) Drying of water Sources

- The unprecedented of water sources such as wells, ponds, streams and water in valley bottoms in the months of May to December is associated with human activities.
- Some beekeepers also maintains water supply by providing water reservoirs near the apiaries.
- The drying of water sources is probably due to degradation of environment triggered by human activities such as deforestation, shifting cultivation, browsing activities and others.
- Due to depletion in the landscape cover, leads to inability of soil to keep water and refill the ponds, streams and valley bottoms.
- Refill of water sources is also associated with availability of rainfall.
- The water is required by honeybees for processing, storing, production of brood food and production of honey. So, shortage of water sources reduce the honey yield.



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3) Loss of foraging plants

- As we know that flora is very important for the production of honey.
- Loss of flora is due to loss of vegetation in any area.
- It is also associated with human activities.
- If the flora is unavailable, the foraging bees will find nothing to collect pollen and nectar and the production and yield of honey will reduce automatically.
- If we are doing commercial beekeeping, this may have a little effect on honey production because we provide substitute pollen and nectar diet.
- But this will affect the natural bee colonies. So, the availability of flora is very important for the increased yield of honey.

4) Anthropogenic Factors

A) Increased Farming Activities:

- Farming is a major source of food and income.
- This activity has contributed to the increase of areas for cultivation which leads to deforestation and environmental degradation.
- The loss of forests tends to reduce water sources, nesting areas and fodder for bees and consequently, affects the production and yield of honey.
- Inappropriate agricultural practices are major threats to forests, and therefore, contributed to the reduction of beekeeping activities and honey production.
- Flowering crops enhance the honey production and yield. For example sunflower, leguminous crops etc.

B) Increased Grazing Activities:

- Livestock rearing is very beneficial and economic but it also influence the honey production and yield.
- If the browsing resources reduce, the livestock holders migrate toward the areas with green pastures and water to feed their livestock.
- Therefore, this will be threatening for the honeybee resources such as water and floral plants.
- Grazing also effects the land cover by degrading it. Grazing is the primary cause of land degradation which effects the plant cover.
- Increasing of cows than the sheep will hinders the growth of heather plants, thus leading to reduction of heather honey production and yield.



- **C) Increased Charcoal Burning:**

- Charcoal burning is reported as other factor in honey production and reduced yield.
- Charcoal production is an important alternative source of both income and energy.
- The increase in charcoal burning activity is due to high demand in both rural and urban areas.
- Inevitably, wanton felling of trees for charcoal burning has been significant impacts on forests and thickets, which have been cleared for this activity. Thereby, diminishing floral sources for honey production.
- It has been estimated that between 100000 to 125000ha of forest is lost annually as a result of charcoal burning.



- **D) Increased Bush Burning:**
- Bush burning is also given as priority as one of the main affecting the honey production in beekeeping areas.
- The bushfire activities are caused by the activities by humans such as farm preparation, beekeeping activities and hunting.
- As a result, bush fire contributes to the destruction of vegetation cover. Thereby, threatening floral sources, killing honeybees and burning of the hives.
- So these activities hinders the honey yield.



Over use of chemicals:

- We use chemicals (insecticide pesticide) for getting maximum benefit from the crops
- We use chemicals (insecticide pesticide) for the control of insects in our fields from several years.
- Over use of chemicals for getting maximum benefit on the crop are the main cause of reducing honey bees in the world which ultimately reducing honey yield.

5) Climatic Factors

A) Unpredictable Rainfall:

- Honey production depends upon rainfall, as it boosts the thriving of flowering plants from which bees collect nectar and pollen.
- Rainfall also provides drinking water for honeybees.
- The diminishing of these resources reduces the foraging for nectar and water and, consequently, leads to low production of honey.
- In addition, the shortage of rainfall makes the area unfavorable for beekeeping activities, which in turn, increases the likelihood of honeybee colonies to abscond.
- Moreover, this absconding of bee colonies as a result of low rainfall may lead to low honey production.
- Shortage will reduce the foraging activities of the bees, water resources and dilution of nectar. Hence, consequently, weakening the honeybee colonies.
- Furthermore, unpredictable rainfall normally limits the bees' capacity to process, store, make brood and hatch eggs. And hence, lowers the honey production and yield.

- **B) Increased Temperature:**
- Studies shows that temperature has a comparatively lower impact on honey production than the effects of low amount of rainfall.
- The available amount of temperature has minimal impacts on the thriving of honeybees.
- But the temperature below 10C and above 40C can reduce the bees visitation and collection which will reduce the honey production and yield.



6) Parasitic Mites

- **A) Varroa Destructor:**
- The most significant ectoparasite of honeybees. This parasite is widespread across most of the continents.
- There are two phases of it. One is attached to the adult and the other is reproductive phase.
- The mite is spread by foraging and swarming bees and Varroa females are transported adult bees to brood cells for reproduction.
- The mite feed on bees by injuring the cuticle of the pupae and sucking substantial amount of haemolymph.
- The haemolymph is insect's equaling to blood, distributing the nutrients throughout the bee, including immune components which form one of the primary lines of defense against invading microorganisms.
- By killing bees, Varroa reduce the honey production and yield.



- **B) Tropilaelaps Mite:**

- This mite is causing problems in modern beekeeping.
- Their damage is similar to Varroa destructor.
- The abdomen of surviving bee from mite attack is reduced in size and have shorter life span than healthy bees.
- in the heavily infested colony, bee with deformed wings can be seen crawling about the vicinity of the hive entrance and on comb surfaces.
- While pieces of dead bees broods evacuated from the hive by house bees can be seen in front of entrance.
- Irregular pattern of sealed and unsealed broods.
- Poor laying of the queen can be observed.



- **C) Tracheal Mite:**
- Unfortunately, there is no reliable typical visible symptoms of infestation.
- But the severe infestation shortens the life span of bees.
- Cause the bees to loose the strength and increases the susceptibility of the colony.

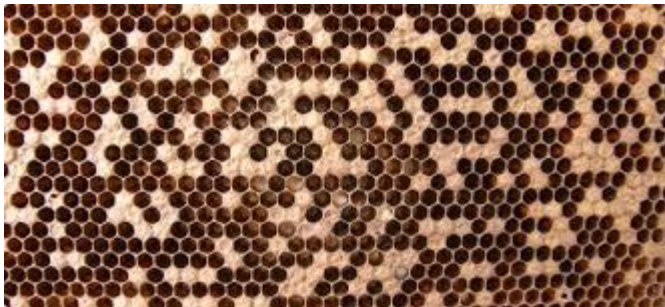


7) Diseases

A) Bacterial Diseases

i) American Foulbrood Disease:

- The brood not comes out the cells.
- The caps of dead brood are darker than living.
- Irregular patterns of sealed and unsealed brood cells can be seen.
- This disease effects the broods by them and reduce the colony efficiency. Hence reduces the normal honey production and honey yield.



ii) European Foulbrood Disease:

- this disease attack on younger larvae than AFB disease.
- Mostly attacks on 4-5 days old larvae.
- Colour of larvae changes to pale yellow.
- Sour odor is produced from dead larvae.
- It effects the efficiency of colony and weakens the colony. Hence reduces the honey production and yield.



- **B) Fungal Disease**

- **Chalkbrood Disease:**

- The dead larvae mummify, harden, shrinks and appear chalklike.
- Reduces number of bees in the colony by killing larvae.



C) Viral Disease

Sacbrood Disease:

- Most common viral disease of honeybees.
- Diseased larvae fails to pupate. This will lowers the bees in the colony. So, reduces the honey production.



- **D) Protozoa Disease**

Nosema Disease:

- Caused by *Nosema apis*.
- No reliable symptoms.
- But in the heavy infestation, the abdomen of bee swollen and shiny in appearance.



8) Insect Pests

A) Small Hive Beetle:

- They eat the canals and destroys the cell caps and honey starts to ferment.
- Its feces changes the color and quality of honey.
- The comb appears as mucilaginous.



B) Ants:

- Apiaries of *Apis mellifera* under ant attack become aggressive and difficult to manage.
- Sometimes, absconding also occurs.
- Kills the bees.



C) Wasps and Hornets:

- These are predators of honeybees. So, reduces the numbers of bees in the colony.
- Also cause absconding of the colony.



D) Wax Moth:

- It feeds on the wax of honeybees.
- Make galleries in the wax.



9) Amphibians

- These are predators of honeybees.
- They mostly attacks during night time.
- For example, frogs and toads.



10) Reptiles

- These are also predators of honeybees.
- They attacks on foraging bees.
- For example, geckos, shinks and other lizards etc.



11) Mammals

- They eat the broods and honey of the honeybees.
- For example, Bear.



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