Bee Keeping

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TOPIC: Apiculture (Bee Keeping/Farming)

THEME: Bees

DEPARTMENT: Entomology

Carpenter bees collected over 115 years ago
Source: NMK - Entomology

Lesson Objectives

1. The participants shall explore apiculture.
2. The participants shall appreciate the importance of apiculture in the ecosystem.
3. The participants shall explore best beekeeping practices.
4. The participants shall appreciate the role of National Museums of Kenya's Centre for Bee Biology and Pollination Ecology.

Learning resources

1. Text
2. Video
3. Photo

What is beekeeping?

Beekeeping, also known as apiculture, is the art of keeping honey bees in order to obtain honey and other bee products such as beeswax, propolis, royal jelly, pollen and bee brood. Bee brood consists of bee embryo or egg, larva and the pupa stage.
Beekeeping is done for socio-cultural and economic gains by humans. It is one of the oldest forms of food production.

History and origin of beekeeping

The history of beekeeping and domestication of honey bees can be traced back to ancient Egypt around 5,000 years ago.
Some of the earliest evidence of beekeeping is from Egyptian rock paintings and manuscripts. Simple hives made from straw and unbaked clay were used, and honey stored in jars, some of which were found in the tombs of pharaohs.
Beekeeping later spread to the rest of the continent through migration and other interactions. Historically, beekeeping was a male dominated activity.
In Kenya, the communities that practised beekeeping inhabited forested regions or the savannah woodlands. The practice of beekeeping using traditional beehives continues even at the present time.
Contemporary beekeeping has seen the introduction of modern hive technology and a shift from extensive systems to intensive systems of beekeeping.

What is the importance of beekeeping?

Beekeeping provides several invaluable benefits to the ecosystem. Apart from producing honey, bees play an important role as pollinators of crops, pastures and trees. This contributes to food security, environmental conservation and absorption of carbon from the atmosphere thereby enhancing climate change adaptation.
Beekeeping also provides an important source of income for many communities.

Advantages of beekeeping

Bee keeping is an important economic activity in the arid and semi-arid lands (ASALs) in Kenya. Some of the advantages include:

- Uses a small piece of land.
- Low capital investment needed.
- Low labour input.
- Production of multiple products such as honey, beeswax, propolis, pollen, bee venom, royal jelly, bee colonies, bee brood and queen bees.
- Improves biodiversity through foraging constancy.
- Increases crop yields through pollination.
- Provides products for treatment of several ailments - apitherapy.
- Provides a stable source of income.

Types of beekeeping

There are two types of beekeeping: traditional and modern.

Traditional beekeeping: This involves using traditional beehives made of wood and straw, and practices that have been used for centuries.The hives are either fixed or movable. Examples of traditional hives include: log hives, clay hives, mud hives and basket hives .

Traditional beehive
Source: iStock

Modern beekeeping: This involves using modern hives which incorporate new technologies to improve honey production and colony management. They are usually made of plastic and metal. Modern hives can be horizontally or vertically stacked. Types of modern beehives widely used in Kenya and much of Eastern Africa include: Langstroth beehive and the Kenya Top Bar Hive.

Modern beehive
Source: iStock

Factors to consider when starting bee farming

Starting up a bee farm requires a beekeeper to consider the factors that will ensure the bees are comfortable and productive. Technical knowledge in beekeeping is a necessary consideration. Factors to consider include:

- Location: Identify the location or area where bees will be kept.
- Equipment: List down all the equipment and tools that will be needed in the beekeeping activity.
- Consider the floral diversity of the area. The area should be dominated by pollinator-friendly flower plants.
- Cost implication: Calculate the total cost of buying all the equipment and tools needed in beekeeping.
- Market range: Determine the purpose for beekeeping; either for home consumption, local or for exports.
- The farming system around the area; either monocropping or mixed cropping.

Stingless bee
Source: NMK - Entomology

Setting up an apiary

An apiary is a place where bees are kept, a collection of hives or colonies of bees kept for their honey. An apiary can house up to 20 hives depending on the availability of flowering trees in the area as bees forage up to 3km from the apiary. Good apiary management starts with choosing a good site to hang or place hives. The following are recommended practices for a good apiary site:

- The site must be easy to get to and from, allowing you to check the hives regularly.
- The apiary must not be close to areas where pesticides are used as this may kill the bees and contaminate the honey.
- The bees will also appreciate being away from smoke, fire and unfriendly neighbours.
- A high hedge or fence should be put around the apiary to separate the bees from people and animals, as bees can be aggressive.
- The apiary should be away from human and livestock dwelling areas, roads, and public or noisy areas.
- It should be safe from strong direct sunshine, in a shaded area during the hottest part of the day but have sun in the morning. A shade must be constructed if none is available at the site.
- It should be safe from strong direct wind while allowing good air circulation.
- It must be near a fresh water supply; this can be a river, pond or even a dripping tap.
- It must be near food sources such as trees or nectar bearing crops, and cash crops that need pollination.
- Put the hives in a lockable bee house or a shed to prevent thieves from stealing the honey. Ensure there are holes in the wall to allow the bees to get enough fresh air in and out of their hives.
- The apiary should be on higher ground, away from marsh or land liable to possible flooding. Humid conditions encourage fungal growth and prevents honey from maturing and bees from foraging.

Principles of apiculture management

Beekeeping management practices vary from low to high intervention in regards to the use of chemicals, hive manipulations and supplemental feeding of colonies. High end interventions include:

- Requeening a honey bee colony when the queen has reduced egg laying capacity.
- Providing a pollination service to farmers in need, to increase yields.
- Constructing and repairing bee hives.
- Artificial insemination (AI) of queen bees.

Carpenter bees collected over 115 years ago
Source: NMK - Entomology

Challenges in apiculture

Most common challenges encountered in beekeeping include:

- Climatic factors such as extreme temperatures and high humidity.
- Lack of bee forage.
- Bee absconding and swarming.
- Bee pests, diseases and honey predators.
- Pesticide poisoning from the farms.
- Lack of beekeeping training programmes.
- Lack of proper or right beekeeping gears.
- Habitat loss.

Conservation measures by the public

There are activities that the public are encouraged to undertake to conserve bees and their ecosystem. Such activities include:

- Planting a tree to provide shade and food for the bees.
- Establishing a bee garden or bee hotel on your compound or farm.
- Avoiding use of pesticides.
- Creating awareness on the importance of bees; becoming a citizen scientist.
- Eliminating invasive species from the farm.
- Avoiding practices that may lead to habitat loss for the bees.

National Museums of Kenya's Centre for Bee Biology and Pollination Ecology

The Centre for Bee Biology and Pollination Ecology (CBBPE) serves as the East and Central African Institution for bee taxonomy for the conservation and sustainable use of pollinators. The centre hopes to bring together various efforts by East and Central African countries to strengthen pollination ecology.

The CBBPE's mission is to promote research on every aspect of Bee Biology and pollination ecology within the region. In addition, it aims to convey to the public the importance of pollinators for natural ecosystems and agriculture. CBBPE works to:

- Increase expertise in Bee Biology.
- Publish research results.
- Set up a comprehensive collection of East African bees.
- Raise public awareness on the vital role of bees in the environment.
- Encourage the use of bees as wealth creators.
- Conserve and protect pollinators and the environment.

CBBPE offers services in:

- Bee identification.
- Reference library on pollination and bee biology.
- Guidance in questions regarding pollination and best agricultural practices.
- Training visiting farmers, colleges and schools.
- Supervision of students, both MSc and PHD.