



Beekeeping Basics with Susan Hosticka

Beekeeping

A person or persons keeping honey bees need protection from bee stings.

- **So what do they need?**
- **A Bee veil,**
- **protective clothing,**
- **.....gloves,**
- **Good shoes**



Tools needed to work bees

You will find a number of items in bee catalogs that can be considered tools to use when working bees.

However, you will need only two:

➤ A smoker



➤ A hive tool



Getting Honey Bees

There are four general ways to begin a colony of bees.

- Start with a swarm.**
- Start with a package of bees.**
- Start with a nuc hive.**
- Start with an established hive.**

Swarm

Start with a swarm.

- It is natural for a hive of bees to swarm. This occurs in the months of April, May, June and even later.
- A swarm of bees in May
Is worth a load of hay;
- A swarm of bees in June
Is worth a silver spoon;
- A swarm of bees in July
Is not worth a fly.



Swarm

Advantages of starting with a swarm

- The bees are **free!**

Disadvantages of a swarm of bees

- You can not depend upon getting a swarm when you need it.
- You have no control over genetics (type of bees) you are getting.
- The bees may be carrying disease!

Packages

Start with a package of bees

- There are beekeepers who sell honey bees.
- The package of bees includes a queen, syrup can to feed the bees, and bees.
- The size of a package depends upon the number of pounds of bees put into the packages.
- A package of bees should not contain many drones.
- A package should reach you as quickly as possible from the date it was shook into the package.



Packages

Advantages of a Package of Bees

- It is moderate in cost.
- You will receive a new queen
- You can select your queen's race (Italian or Carniolan)
- The bees can be scheduled for arrival so you can be ready for them when they arrive.

Packages

Disadvantages of a Package of Bees

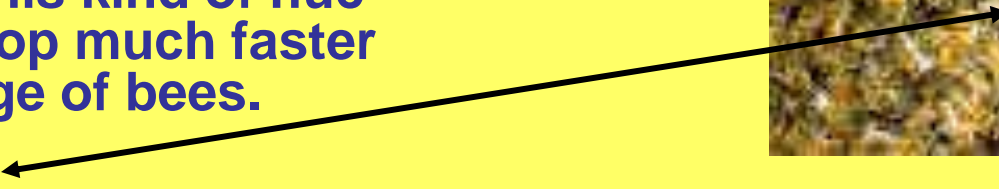
- They take longer to develop into a production hive.
- The queen sold with the package is untested. That means you could face several queen problems such as: the queen not being accepted by the bees in the package; the queen may be a poor laying queen – poorly mated; supercedure problems (the queen is replaced by the bees during the current season); or she may exhibit aggressiveness in the bees she produces.
- If a queen fails, the beekeeper needs to quickly react before the new hive is lost. I recommend that the beekeeper should check to see if the new queen is laying eggs within the first week after the package is installed into a hive. **No eggs means something is wrong.**
- **Usually a package of bees is not guaranteed for success by the seller.**

Nucs

Start with a nucleus hive.

This is called a nuc!

- It will cost more than a package of bees.
- It will contain at least two or three frames of capped brood, a laying queen, and eggs & larva in various stages of development.
- The nuc will have drawn comb rather than foundation.
- **Watch out for nuc's sold with just bees and new foundation.** This is nothing more than a package put into a box. This kind of nuc will not develop much faster than a package of bees.
- **The Queen**



Nucs

Advantages of a nucleus hive.

- It is already a miniature hive with a laying queen and brood. The bee population is growing because new bees are being added to the population every day.
- This hive should produce a good crop of honey the first year.

Disadvantages of a nucleus hive

- Because a nucleus hive has drawn comb, one must be aware that drawn comb may include AFB spores. This is a serious disease.
- Some sellers try to sell a nuc by using very old comb (dark), or start a nuc on new foundation which is not drawn out when you buy the nuc. **Avoid paying a high price for such nuc's.**

Full Hive

Starting with an established hive.

- This is usually one way to assure yourself of a honey crop.
- The hive will contain drawn comb, some honey reserves, and a good population of honey bees.
- The hive will be most expensive if it is housed in like new equipment. Prices vary according to condition of equipment.
- **Note: We are not discussing a new hive stocked with new frames, un-drawn foundation, and a newly installed package of bees.**



Full Hive

Advantages of an established hive.

- This hive should produce a good crop of honey the first year.
- It could be split into two hives if it is strong enough.

Disadvantages of an established hive

- It is going to be the highest cost of getting into beekeeping.
- It may swarm early in the bee season. It will require honey supers quickly in the spring. Management of this hive will differ from other hives started with smaller populations - you will be on a quicker timeline.
- Because an established hive has drawn comb, one must be aware that drawn comb may include AFB spores. This is a serious disease. It may also have large populations of mites which will need to be controlled.
- It may have an old queen which needs to be replaced.

Locating Your Apiary

- **Should face south or east**
- **Several feet between each hive**
- **Should be on wooden pallets or boards about 4 inches off the ground and level**
- **Near dependable water, nectar & pollen source (within a 2 mile radius)**
- **Easy vehicle access**
- **At least 2 miles from other bee yards**



Let's Go

I am sure you are ready to suit up, grab a hive tool, light your smoker, and get started....

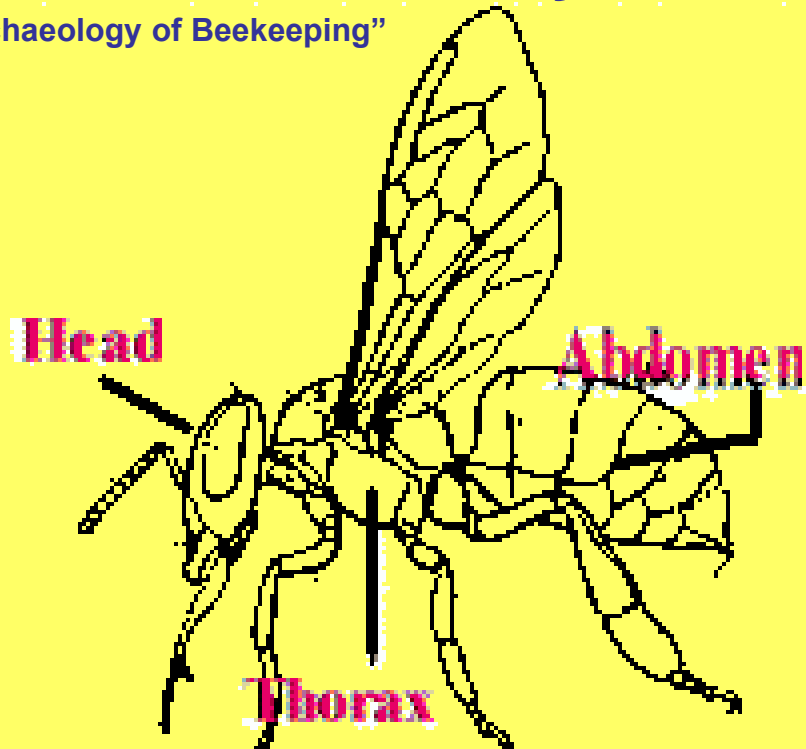
But first, lets take a look at what honey bees are!



Honey Bees

Have existed for a few million years. For ten thousand years, records have survived of man's exploitation of honey.

From "The Archaeology of Beekeeping"
by Eva Crane



An introduction to the bee's world

The honey bee is a highly socialized insect.

Apis mellifera

- The scientific name for the honey bee. You will see the word honey bee spelled as two words and as a single word. But it is correct to spell it as two words like House fly, and bumble bee. *Apis mellifera* is the scientific name for the honey bee. The honey bee is an insect. Insects are classified as having
 - 3 body parts (head, thorax and abdomen)
 - one pair of antennae
 - three pairs of legs
 - and usually one or two pairs of wings



Apis mellifera

- **According to Theodore B. Mitchell who spent 38 years of his life studying bees "Bees are essential to our economy, being the chief pollinating agents of the flowering plants. They have a relation not only to agriculture, but to the conservation of wildlife and game management, and constitute an important element in the various ecologic factors that combine to form our environment. Thus the production of fruit crops such as apples, pears, melons, cucumbers, grapes, dewberries, huckleberries and strawberries, as well as cotton and various seed crops such as alfalfa, several clovers, vetch, onion, asparagus, buckwheat and celery, are dependent upon a sufficient population of bees, either the domesticated honey bee or some of our native, wild, solitary or social species."**

A Honey Bee Colony

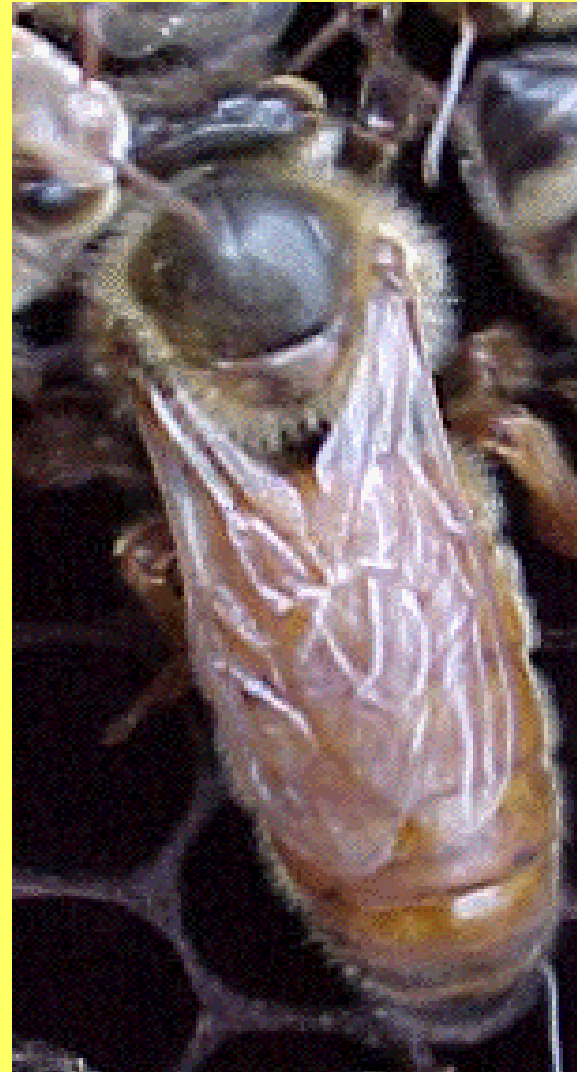
- Honey bees live in a colony of many individuals whose joint effort is required for survival. Within this colony of bees are both females and males. The males are called drones and are necessary for mating with the queen. They gather no nectar or pollen for the hive. They also have no stinger. There may be 300 to 500 of these in a strong hive. Each colony will have a queen. She is the mother of all the bees in the colony. The queen is a female as are her daughters the worker bee. Both the queen and workers have stingers but only the worker bee is usually associated with stinging. The queen uses her stinger to kill rival queens.



The inhabitants of the hive

Meet the queen:

- The queen is a mature female. She lays thousands of eggs during her life time. A good queen may lay over 2000 eggs in a single day. A queen has the longest live span in the colony living for up to four years. She is larger than the other bees in the hive and has a slim torpedo shape. She does have a stinger, but uses it to kill other queens. **Under normal conditions a hive will have only one queen.**



The inhabitants of the hive

Meet the worker bee:

- **Worker bees are sexually underdeveloped females. They may number as many as 60,000 in a colony. The population of a colony depends on a number of factors such as: the egg laying ability of the queen, the space available in the hive (area where the bees live) and the incoming food supply. They are called workers because that is what they do. They collect food and water for the colony, build wax comb, do the housework, maintain the interior temperatures of the hive and guard the hive against intruders [in other words: they can sting]. Female worker bees under certain conditions can lay eggs but because they are not mated, they produce eggs that only develop into drones.**



The inhabitants of the hive

Meet the Drone bee:

- Drones are the males in the colony. Note the general shape of the drone. Notice two things: 1) the head is large and the eyes predominate the head and 2) the rear-end of the drone is rounded -- **they have no stinger and can not sting.** Although they are usually considered worthless, they contribute to the continuation of one generation to the next generation.



Biological Information

- All honey bees come from eggs.
- All honey bees develop into larva.
- All honey bees go thru something called metamorphosis.
- The development times for all honey bees differ by caste.

Lets look at each of these.

All honey bees come from eggs

- A queen honey bee can lay over 2000 eggs in a single 24 hour period.
- If your math is good, multiply this by 10, 20, 30, and 40 days the general life span of worker bees.
- Eggs are deposited into cells.



All honey bees develop into larva

- Larva in cells look somewhat like little worms. The body is composed of a head plus 13 ring-like divisions or segments.
- It grows to fill the cell very quickly. Between the day it emerges from the egg until it reaches the fifth day of development, it will grow six times it's body weight during each 24 hour period of development.
- Healthy larva are white in color.



All honey bees go thru something called metamorphosis

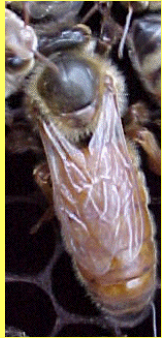
- This means that the honey bee during its development into an adult will pass thru several distinct stages from egg to adult.
- When a cell is capped – the larva transforms into a pupa. From a pupa it will develop into a imago. It then emerges as an adult.



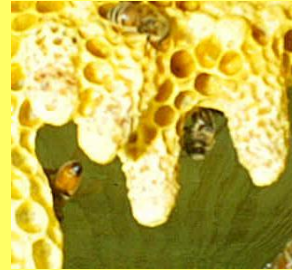
The development times for all honey bees differ by caste

	Egg	Larva	Pupa	Emerge
Queen 	3 days	4-5 days	8 days	16 days
Worker 	3 days	5-6 days	12-13 days	21 days
Drone 	3 days	6-7 days	14 days	24 days

The cells of honey bees differ by caste



Queen
cells



Worker
cell



Drone
cells



Some Facts About....



The queen bee

- She develops from a fertilized egg.
- She must mate with a drone to produce fertilized eggs.
- She is the mother of all the bees in the hive.
- She may live for 5 years or more.
- Her role in the hive is to produce eggs and to release pheromone signals within the hive.



Some Facts About....



The worker bees

- She is developed from a fertilized egg.
- The worker bee lives for a short period of time – usually a period of about 40 days.
- A worker bee spends its first 20 days in the hive performing various tasks – cleaning cells, feeding young larvae, building wax comb, etc.
- She defends the hive. It has a stinger.
- The worker bee also has pollen baskets on her rear legs to gather and collect pollen while she is foraging for nectar outside the hive.



Some Facts About....



Drones

- The drone is the male bee in the hive.
- He develops from an unfertilized egg. Meaning he is passing on genetic material from his mother only.
- He provides $\frac{1}{2}$ of the genetic material in worker bees.
- His life span depends on the health of the colony. During poor honey flows and honey shortages, drones may be driven from the hive. This happens at the onset of winter as well.
- Drones can be created by laying worker honey bees.



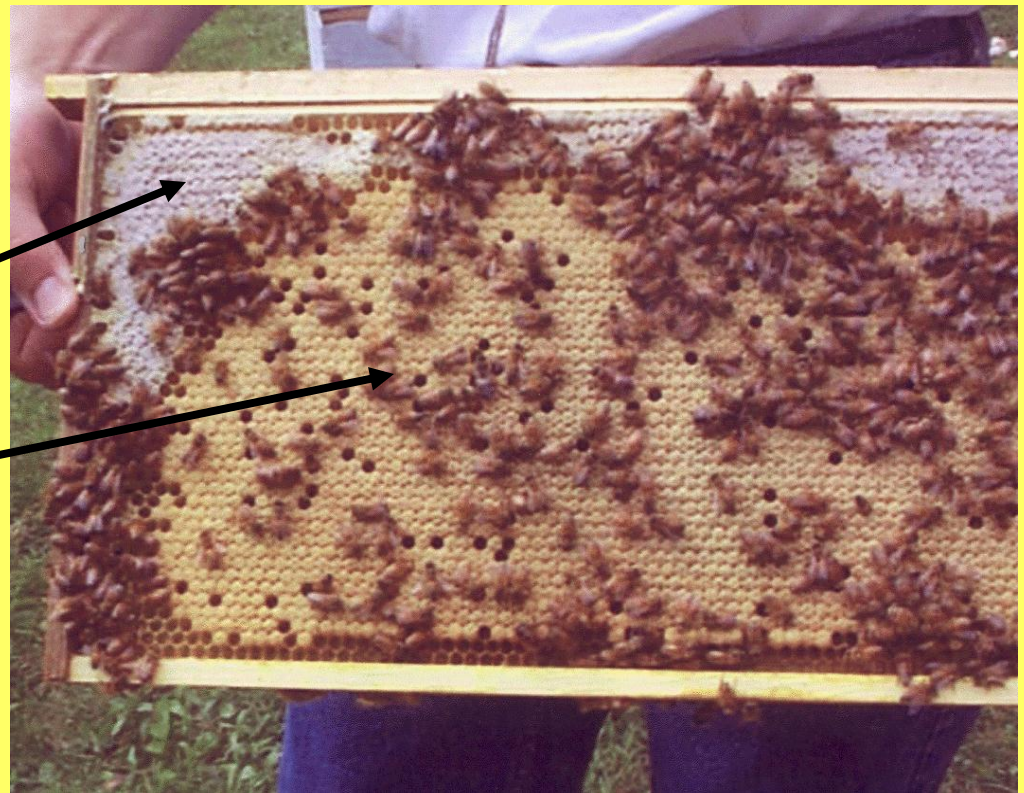
Some Facts About....

What you will observe within a hive of bees

This frame from
the brood
chamber is
close to ideal.

Honey is stored at the
top of the frame

Capped brood fills
much of the rest of
the frame.

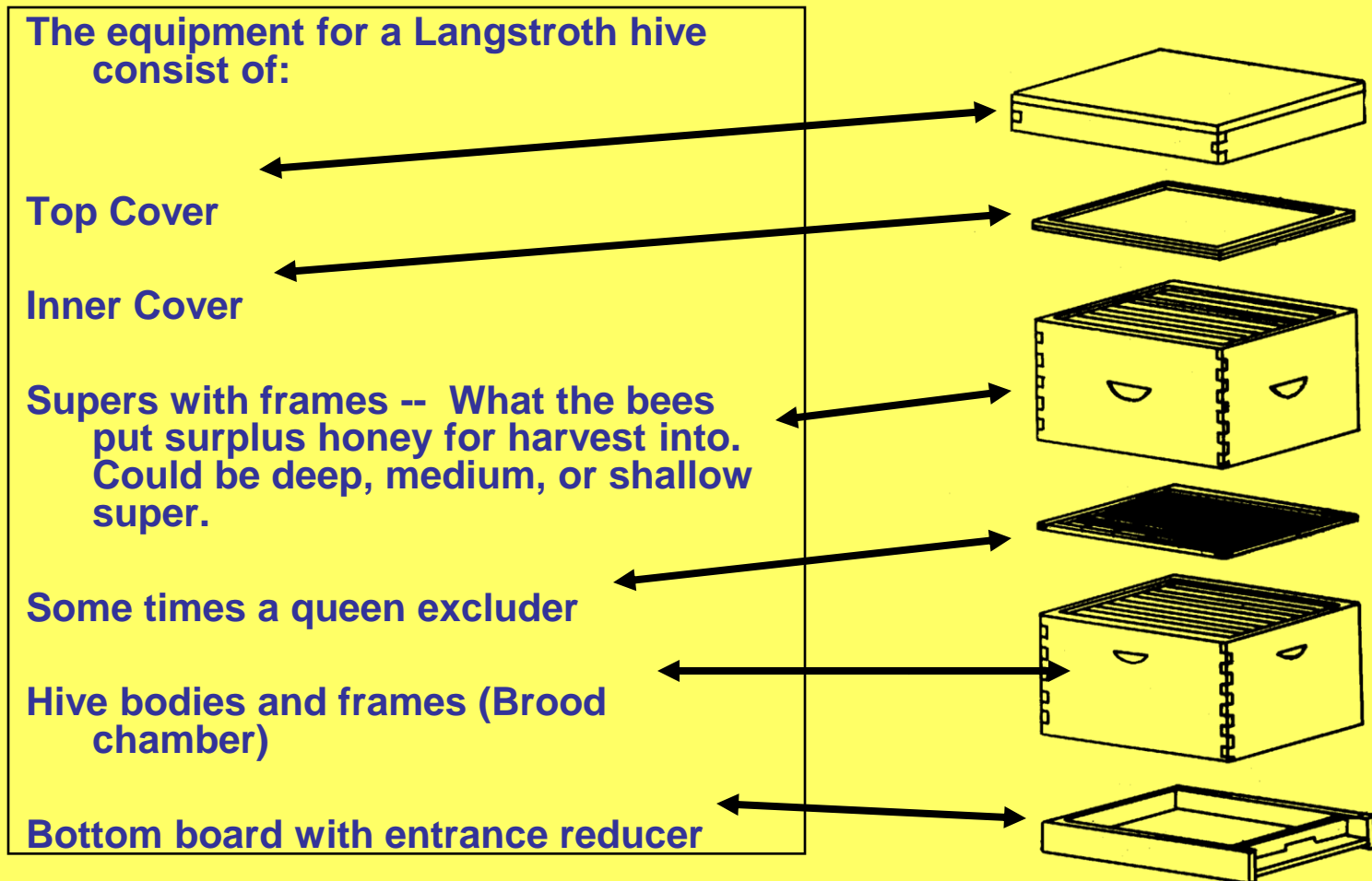


Selecting The Right Bee

There are 3 main strain or race of bees used locally. Packages are available with Italian or Carniolian Queens

- Italian Bees are yellow in color and used exclusively by commercial beekeepers
- Carniolian Bees are dark in color, adapt well to cold winters and have many good traits. We use Carniolians and Caucasian
- Caucasian Bees are also dark in color, they are gentle and collect a lot of propolis

What You Will Observe About A Hive of Bees



Managing Bees

Up to this point

Now we are going to look at what beekeeping involves!

As a new beekeeper, your starting point will vary with how you acquire bees and the equipment you have or will buy.



Starting with a swarm or a package of honey bees

At some time or another, a beekeeper will install a swarm or a package of bees into a hive.

- The procedure is about the same for either.
- The goal is to get the bees from a bush, tree, etc. or the package into a hive box.



Starting with a swarm of honey bees

Be Prepared.....

You need something to put the bees into!

The equipment needed for both a swarm and a package of bees.....

- A single deep hive body with frames, bottom board, inner cover, and top cover. Also a feeder to feed the bees for a short period of time.
- Sometimes a swarm is not worth getting.



Starting with a swarm of honey bees

- Swarms come from existing colonies of bees.
- A swarm consist of the old queen and a large number of worker bees and some drones.
- It will vary in size.
- Generally the bees are very docile.



Starting with a package of honey bees

I would highly recommend buying a three pound package to get a hive started.

- A package of bees is a screened box that hold the bees, queen and syrup can.
- The contents of the package..

Cover for syrup can and queen

Queen cage with queen

Syrup can

Bees

- Keep your package in a dark cool place. Do not expose to heat or very cold temperatures.



A Year In The Life Of A Bee

Winter

Honeybees live inside the hive through winter but do not hibernate. The workers form a cluster about the size and shape of a rugby ball around the queen. They huddle together and shiver to keep each other warm. As the weather gets colder the queen lays fewer eggs and may stop laying altogether, so the workers have little or no brood to care for. Good time to treat for varroa if necessary.

Winter to Spring

When the weather starts to get warmer in early spring the queen will lay eggs again and the colony will develop and grow in numbers. On warm and dry days the bees will fly away from the hive on 'cleansing flights' (to defecate) or to forage if there are suitable plants nearby.

A Year In The Life Of A Bee

Spring to Summer

The colony will continue to increase in numbers from 10,000 bees to around 50,000 bees in the summer. The hive should be at its fullest around July when there is a plentiful supply of nectar from plants and the bees should have an abundance of crops to forage.

Summer to Autumn

The queen will gradually reduce the number of eggs that she lays and the colony's population will decline. Eggs that are laid in autumn develop into winter bees who have a life cycle of about five to six months. Summer bees may only live for about six weeks, because workers eventually work themselves to death by collecting food and water for the hive. The queen has a much longer life cycle and may live between 2 to 4 years.

Lifelong Commitment

- Be a lifelong learner of honey bee biology and management
- Participate in local, regional, and/or national beekeeping organizations
- Subscribe to one or more beekeeping journals
- Visit and bookmark your favorite beekeeping Web sites
- Read books on beekeeping
- Most Importantly Have Fun

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THE REWARDS

Thank You



Any
Questions?

