

## Useful Web Sites

### ***Top Bar Hive Sites***

<http://www2.gsu.edu/~biojdsx/main.htm> (for top bar hives)  
<http://www.bushfarms.com/bees.htm> (Kenya and Tasmanian Top Bar)  
<http://mielfarm.com/home.htm>  
<http://beenatural.wordpress.com/top-bar-hives/>

### ***Virginia:***

<http://www.virginiabeekeepers.org/> (Virginia Beekeepers Association)

<http://law.justia.com/virginia/codes/toc0301000Toc03010000022000010000000.html> (The laws of Virginia on Bee-keeping)

<http://www.virginiabeekeepers.org/newsletter/VSBA0903.pdf>

### ***Tennessee:***

<http://www.state.tn.us/agriculture/regulatory/apiaryregistration.html>

<http://web.utk.edu/~wu4you/ACBeekeepers/TNApiaryLaw.htm>

<http://www.tnbeekeepers.org/learning.htm>

### ***Other Sites:***

<http://www.abfnet.org/> **American Beekeeping Association**

<http://www.beeculture.com/> **Magazine**

<http://www.ibiblio.org/bees/> **Beekeeping archive**

[http://www.beedata.com/bee\\_mags.htm](http://www.beedata.com/bee_mags.htm) **listing of magazines**

<http://www.biobees.com/> **organic top bar beekeeping**

### ***Useful Books:***

Beekeeping—A complete Owner's Manual by Werner Melzer

Beekeeping—A Practical Guide by Richard E. Bonney

Beekeeping in Tennessee pub#1745 by University of Tennessee

### ***Contact People:***

Tennessee: K&K Bee Supply 423-753-4420 Ken Saylor owner close to Gray, TN.

Virginia: Linda Ernst 276-628-8064—President of The Highlands Beekeeper Association in Abingdon, VA



# A Simple Guide to Beekeeping



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Note: this book is a compilation of many classes, books, and personal knowledge and intended as a tool for beginning your adventure into beekeeping. It is intended for classroom use only. Some photos were retrieved from the Internet. On the back cover is a list of sites where some photos originated.



## Medications

Medications in our area are generally inserted into a hive in October of each year. Open the hive, generally just above the Queen excluder, insert the medication on a warm day (60-70 degrees if possible). Most medications work best at 70 degrees (rule of thumb). Most strip medications are harmful to humans and will need to be handled with rubber gloves (washed before you remove the gloves from you hands). All medications are applied with either no honey on the hive or at least without the honey that would be sold at the markets. Medications are applied from 14 days to 40 days depending on the application and type of medication.

The vegetable shortening patties mentioned below are made up of one part vegetable shortening (fat), three parts of granular sugar, and one part of shortening with terramycin (antibiotic). This patty composition is generally carried by your bee hive supplier. Make four patties out of your supply and place on the four corners of the Queen excluder.

All strips of medications are simply suspended between frames and removed when the proper time has elapsed.

Medication	Disease
<b>Shortening Patty</b> Vegetable shortening, sugar, terramycin.	Protects against Foulbrood, Tracheal Mites
<b>Menthol bags</b>	Mites
<b>Apistan Strips</b> Pyrethroid chemical (fluvalinate)	Mites
<b>Fumagillin in sugar water</b>	Nosema (controls disease only)

**European Foulbrood** is not as devastating as the American variety. It will often clear up on its own accord. Inspection of the brood cells is the only way to distinguish between the American and European strains. A strong hive will generally recover on its own. A weak hive may not make the recovery.

**Sacbrood** is a virus and most hives carry the disease but it only comes to the surface in hives under stress. A weakened hive may self-destruct with sacbrood. There is no known treatment except to keep your hive strong and vibrant.

**Chalkbrood** is a fungal problem that is new to north America. The larvae die quickly and become a chalky mass. It has become common in hives to see this but the hive will generally handle the problem on its own. If the beekeeper finds it in large quantities, burn the infected frames and replace.

**Nosema** is a protozoan problem. This disease attacks the adult bee and is found in their stomachs and results in a short lifespan. It affects the Queen's ability to lay eggs and the end result is a consistent weakening of the hive until the hive dies. This disease is common and is controlled with medication of the hive.

**Mites** entered the USA bee population in the 1980s. There is some argument as to the exact time and it is really unimportant. We have them and that is all that matters. They are devastating to any hive and practically speaking, they always exist within most hives. The two mites that cause most of the problems at the Tracheal and the Varroa. The Tracheal mite sets up home in the tracheae of the adult bee and stays with the adult for the mite's entire life cycle. It's presence eventually will block the tracheae. It seems that it is the overwhelming number that finally kills the bee host. The Varroa will attack the brood larva. By the time Varroa mites are adults, they have found a host and attack the abdomen sucking blood from the host. Enough of these attacks will weaken and finally kill the host bee. Medication is a means of control.

**Ants** may become a problem. If they do, mount your hive on legs which are immersed in cans of oil. Ants are generally not a big problem.

**Wax Moths** can be a problem but will die out over winter. A rare problem.

**Mice** will take up residence during winter since the hive is warm and the bees are usually clustered. The mouse will move away from the cluster and build a nest to keep it free from the bees. Should the bees find the mice, they will kill it or run it off. If the mouse is killed within the hive, the bees are not strong enough to move it out and will cover the mouse with propolis. The mice can cause enough disruption that the bees will simply leave the hive and die as they do because of winter temperatures.

**Skunks** can be a real problem. They will eat the bees as they emerge from the hive. They catch them, roll the bee on the ground, and then eat balls of bees that they have harvested. Tacks pushed through shingles will discourage.

Skunks are immune to the bee sting and will feast until they have their fill.

**Bears** will, once they find the hive and have a taste, destroy the hive. Electric fencing will help but only before the hive has been tasted.

## Why Beekeeping?

Bees are just one part of good agriculture. There are many insects which work in the pollination process but bees are a dominant factor in crop success. This makes the effort to control pollination a major factor in man's desire to have successful food and flower crops. The reasons for beekeeping range from the farmer's desire to the passionate hobbyist. It should be noted that beekeeping is only as complicated as you wish to make it.

Many beekeepers will keep a hive or two just for the purpose of pollination and not for the honey or wax production. The aim of these beekeepers is to keep the hives healthy and productive to insure their food crops. Other beekeepers will want the pollination, the wax, and the honey. Still others will only want to harvest the honey and/or wax (candle making). Those of us who participate in our local farmers markets will easily find customers for the honey and candles and our produce will be abundant.

If we look at the habits of beekeepers there will be those who will visit their hives daily and tend to the bees well being. For myself, this method of beekeeping is more harmful than allowing the bees to tend to their own ways. We can help these industrious creatures in building their hive framework, be on the lookout for predators, and to render first aid when it is needed.

This booklet is nothing more than a classroom tool. There are plenty of good books available (amazon.com is a good source). There are plenty of organizations working to inform and teach methodology. There is enough to learn that a one hour classroom session can only wet the appetite of the future beekeeper. This area of knowledge and practice is not only interesting and passionate but the byproducts of your work and concerns will reap sellable product and great personal satisfaction.

## The Bee

### Labor within the Honeybee Colony

**Worker:** The Worker is the smallest of the bees in a hive. The Worker does everything except for the reproduction. They will build the honey comb and brood chamber cells, do all of the housekeeping which includes guard duties at the hive entrance. They will nurse the young and feed the Queen and Drones. The lifespan of the Worker is about 40 days with the first 20 days being spent inside the hive and the last 20 days spent foraging for food and water. Their lifespan may increase during the winter due to less activity being required. Older Workers can be spotted by their tattered wings or the reduction of wing size due to wear and tear. The Workers will also govern the temperature in the hive by either grouping around the other bees to add warmth or separate within the hive to work their wings as fans to cool the hive down during hot weather. From egg to Worker it takes 21 days.

**Drones:** The Drones purpose is in the mating with virgin queens. It is suspected that they may also help in governing the temperature within the hive. The Drones are the largest of all of the bees in the hive. Drones die while in the air after mating is completed. From egg to Drone it takes 23 days.

**Queen:** There is one Queen to a hive. She is the sole female within the hive and will lay between 1000 to 3000 eggs from the month of February through the month of October. The Queen will lay both fertilized eggs (becoming either Workers or new Queens) and unfertilized eggs (becoming Drones). The Queen mates as a new queen for around 6 weeks with the Drones. The mating always takes place in the air. After she mates with 6-8 Drones she will assimilate enough spermatozoa to last her a lifetime of egg laying. From egg to Queen it takes only 17 days.

## Food

Bees require two types of food to survive. First is nectar from flowers and trees. Nectar from flowers is a thin liquid that is processed by the bees. The Worker will collect the flower nectar and its body will immediately begin to eliminate the water from the nectar. The elimination process will continue from Worker to Worker. When the field Worker returns to the hive the deposit of nectar is set into a cell. Then another

## Diseases, Pests, Predators

### Diseases:

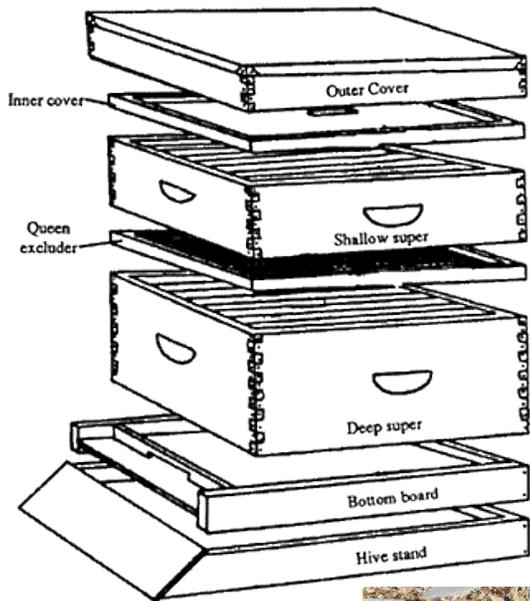
- American Foulbrood
- European Foulbrood
- Sacbrood
- Chalkbrood
- Nosema

### Pests & Predators:

- Tracheal Mites
- Varroa Mites
- Ants
- Wax Moths
- Mice
- Skunks
- Bears

Diseases come in several forms including bacteria, viruses, protozoa, and fungi. They will attack from many different directions. Some will attack the adult bee while others will attack the brood and honey. The diseases that attack the brood are the most devastating. It is very important to remember that all of the diseases are not harmful to man. Even the honey can be eaten without repercussions. Human consumption of honey can be dangerous when medication is added to a hive.

**American Foulbrood** is the most devastating disease to a hive of bees. This is a spore-forming bacteria, which affects the brood only. The spores are carried by the adult bee and will be found in the honey. The honey is how the entire hive becomes infected. The spores will be found in and throughout all surfaces of the hive body. The brood will die and other bees from other hives will invade stealing the honey from the infected and dead hive and take it to their home hive which then suffers the same fate. There are lots of indicators for a hive in decline but the smell of dirty socks is a strong clue to the disease. The only way to eradicate this disease is by immediately burning the entire hive.

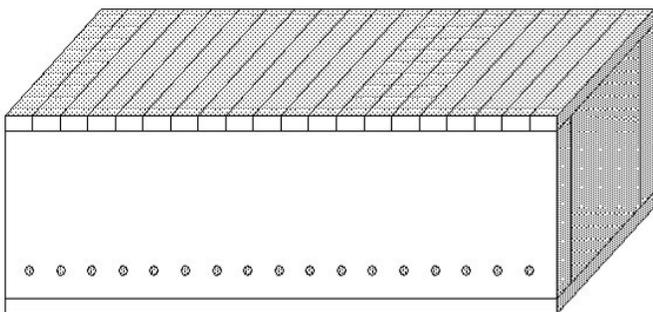


Left is the Standard Hive also known as a Langstroth Hive

Elements of a beehive



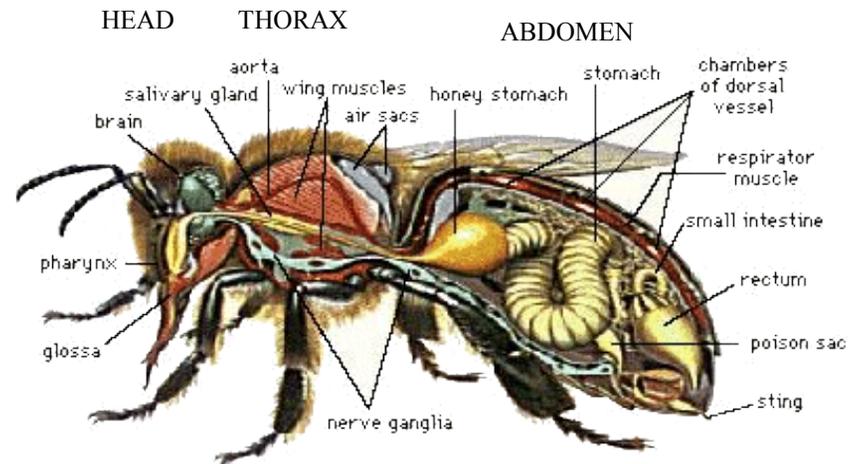
To the right is a basic Kenya Top Bar Bee Hive design.



This is a Tanzanian Top Bar Hive

hive Worker will collect the nectar and eliminate even more water until the content is only about 17 percent water. As the nectar is passed from bee to bee, enzymes are inserted into the nectar until finally the process yields the honey that is then stored. This process is also duplicated for an inferior honey that originates as honeydew. Honeydew is a byproduct of aphids and other scale insects that suck sap from forest trees. The bee will drink this and process it as it does with nectar. The honey provides the bees with carbohydrate food.

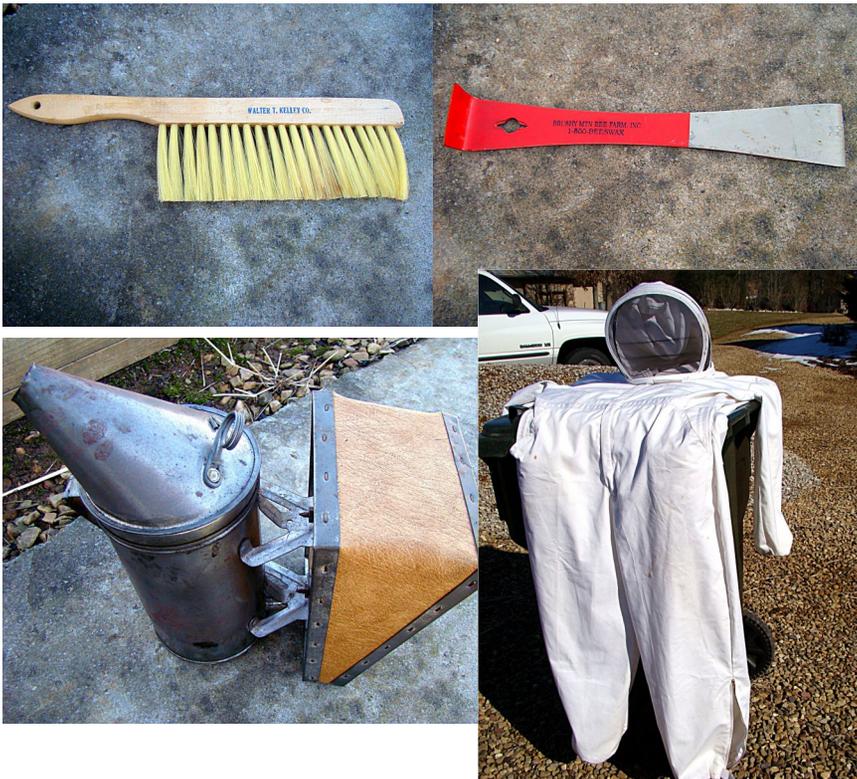
The bee also needs protein and that is found in pollen. As the bee visits a flower, the pollen of the flower will catch on the hairs of the bee's body. The bee will then "comb" itself collecting the pollen from its body into pollen sacs that are a part of its hind legs. The pollen will be combined with some of the collected nectar to allow the pollen to be formed into a compact ball. Once this ball of pollen is delivered to the hive, young Worker hive bees will compact the pollen into cells for future food use.



## Useful Tools

Tools for Beekeeping can be a complicated as you wish to make it or as simple. I prefer the simple side. Here is a list of what is useful.

- **Hive hand tool** (this is useful but a screwdriver will work. The curved end of this tool can help to extract frames.)
- **Hive Brush** (This tool helps to lift off bees from the frames. Very useful when trying to take off a super for honey processing.)
- **Smoke Can** (Some keepers do not use smoke. They consider it polluting the hive with burning twine and newspaper. Some will use dried grass but that makes for a short session since the grass will burn quickly. The smoke will calm the hive and keep the bees congregated. The smoke encourages the bee to gorge themselves with honey. They are too busy to become defensive.)
- **Uncapping tool or Electric Hot Knife** (This tool is used to uncup the honey cells for the extraction of honey. There are spinning tubs that uses centrifugal force for honey extraction but the it does cost a little bit and if you have an organization, you may be able to rent one.)



## The Hive

There are several types of Bee Hives. There is the Leaf Hive, which is a single box divided into two compartments. The Leaf Hive is designed to be given care and maintenance from inside of a building. There are also Leaf Hives that operate from a trailer setting. The Leaf Hive is generally used by large bee concerns having many hives at one location. The Leaf Hive is also popular as a traveling hive, which moves to different fields for pollination.

The “standard” hive that is most popular by the common beekeeper it now called the Standard Hive that originated as the Langstroth Hive. This is a stackable or moveable frame hive. Most state governments recognize this type of hive as the standard for the industry.

There is also a hive construction call Top Bar Hives. Top Bar Hives come in two basic kinds. There is the Kenya and the Tanzanian designs. The Tanzanian design is nothing more than a rectangular box while the Kenya design is triangular. The reason for the Tanzanian is for simplicity. It can easily be built and could be easily expanded as the Standard Hive can. The drawback to the Tanzanian is that on hot days (over 100 degrees F) the comb can collapse. The diamond shape of the Kenya design makes the comb much less susceptible to collapsing. Both of these designs are easy to work with meaning less upper body strength is required. The biggest reason that these top bar hives remain in the mainstream of beekeeping is due the ease and inexpensive costs involved. However, the knowledge required of the beekeeper is much more extensive.

### Location of a hive:

Hive location can be tough. Start with finding level ground. You would not want to locate a hive close to your neighbors or too close to livestock for obvious reasons. It is good to have the hive entrance pointing south. Wind is of great concern. It is best of have a windbreak for the hive and this is especially true of the winter winds. Is it best to conceal your hives by hedges or trees since people will steal hives or queens or just for purposes of vandalism. Partial shade from a deciduous tree is also a good thing since full sun will mean more work for the Workers with efforts to keep the hive at proper temperatures. You want deciduous tree cover so the winter sun will help to warm up the hive. You will also want space around the hive to work comfortably (3-4' is good). Make certain that there is plenty of food to be foraged.