



## *Basic Beekeeping*

Beekeeping basics: Keeping honey bees is a fascinating and profitable pastime that can be enjoyed in several ways. You may want to keep bees for the honey they produce, or you may want to keep them for their services as pollinators, or just because you would like the fun of learning about one of nature's most interesting insects.

You can keep honey bees almost anywhere in the United States. We would like to alert you to the fact that keeping bees is not for everyone. If you have had an allergic reaction to a stinging insect such as wasp or bee, you should use extreme care. A single honey bee sting can bring on serious reactions to some people -- even causing death. Normal reactions include: pain, and swelling at the sting site. The good news is that one can wear protective equipment designed to avoid bee stings.



### Basic facts about honey bee biology:.....

Honey bees are social insects. This means that they live together in a colony and depend on each other for survival.

Most of the bees in a colony are workers. Some are drones whose function is to mate with a virgin queen. Usually there is only one queen in a colony.



- 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.
- 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. The worker bees usually determine the number of drones that can be found in a colony. A strong healthy colony may have as many as 300 or more drones. As winter approaches, the workers drive the drones from the hive to starve.
- 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 five 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. I have handled thousands of queens and have never been stung by one.

### Bee Strains

As a beginning beekeeper you should know that there are three primary strains of bees kept in the United States. If you are wanting to purchase bees, these three strains are what most breeders offer. These are:

- Italian -- This strain of bees was imported to the U.S. from Italy during the 1860's. It has proven to be a rather hardy bee, industrious, relatively gentle, and yellow in color. Historically, before the Italian was introduced to the U.S. the German Black Bee predominated but because of the outstanding characteristics of the Italian, beekeepers rapidly switched and the German Black Bee is no longer to be found in the U.S. for sale.
- The Caucasian strain is a gentle bee grey to black in color. They have a tendency to use an excessive amount of propolis. (Propolis is called bee glue - it is a gummy substance collected by bees from trees and is used to seal holes and spaces in their hive).
- The Carniolan strain is one of the more popular bees in current use today. It is a black bee and is very gentle. Its outstanding characteristic is that it seems to adapt very well to colder climates. You may see terms like "Russian", New World Carniolan or "Yugo". These bees are Carniolan strains.

### What bees need:

Honey bees need shelter, nectar, pollen, propolis, and water.

- Shelter -- In nature, the honey bee uses a number of natural cavities to build their brood nest. The term "Bee Tree" was once common. It referred to a tree that had a colony/swarm of bees living in it. The reason we can keep bees is because honey bees will adapt to man made hives for shelter.
- Nectar -- Bees can't make honey without nectar (nectar is the liquid sugary substance produced by flowers). Hundred of plants produce nectar but they are not all major sources of honey. Often we refer to honey as "wild flower honey". What that means is that the honey produced by the bees comes from a number of nectar sources. However, bees do produce crops of honey from certain major nectar sources and these are easily identified by taste and color-- examples include: buckwheat, clover, fireweed, goldenrod, locust, tulip popular, tupelo, sage, sourwood, star thistle just to mention a few.
- Pollen -- As worker bees gather nectar from flowers, tiny particles of pollen stick to their bodies and are accumulated in pellets on their hind legs. The hind legs are equipped with pollen baskets (hairs and special structures on the bees leg) to carry the pollen back to the hive. Pollen is sometimes referred to as "beebread". Pollen contains the nutrients that are converted into larval food by special glands in the worker bees which is then used to feed young larvae. it should be noted that honey bee workers also produce what is called "Royal Jelly". Royal Jelly is a

special food that is given to larva to be raised as queen bees. It has been estimated that a strong colony of bees may use 100 pounds of pollen each year.

- Propolis -- As we have already described it, propolis is used by the bees to cement holes and cracks in their hive. It is gathered by honey bees from secretions in trees and shrubs. Bees have been know to encase a dead mouse inside their hive with propolis.
- Water -- Water is essential for the survival of the hive. Bees should always be located near a good water source or the beekeeper should provide one for the bees.

### Getting Started:

The best time to start beekeeping is in spring time. Fruit trees and flowers are in bloom and should supply the new colony with sufficient nectar and pollen. If you have never kept bees before, do not start with more than two or three hives. Having a few bees around doesn't make you a beekeeper. Some people become bee-havers. The difference lies in how much you know about bee behavior and how successfully you apply this knowledge!

### Who can keep bees?

Beekeeping can be undertaken by anyone who has enough ability and determination to look after the bees properly, enough courage to work with bees, and enough money to buy bees and equipment. Please note: Before you get into beekeeping, you should check to make sure local zoning laws allow you to keep honey bees and what your reaction is to bee stings.

### Getting bees

Traditionally a person starts beekeeping by building hive equipment, buying packages of bees, and installing the bees into the equipment. It is possible that you could purchase a nuc (a nuc is a small hive. Generally it can be three, four, or five frames of brood and bees with a queen. The bees have begun to build new comb and the queen is already laying eggs. Or a person could buy a complete hive. We will discuss each:

1) The complete hive This is the easiest way to get started. It does have some drawbacks.



Double Deep



\_\_Story and a half



\_\_Single

Above are three typical configurations of bee hives that you might find for sale. The price you will pay for a hive can vary considerably. Don't pay more than what you would spend for brand new equipment and bees. At present that should be no more \$150.00 per double hive configuration.

- The hive will have to be moved to your location. The question here is who is going to move the hive? If it is your job to move the hive, you will need some means to pick it up, some means to transport it, and a method to prevent the bees from getting out of the hive.
- Check for disease You should also make sure the bees and equipment are free of American foulbrood. The easy way to do this is to have the bee hive inspected by a state or county bee inspector. Note: Not all states have inspectors. If your state does not have bee inspectors, then have someone who you can rely on inspect the bees before you purchase them.
- Check for condition of queen and bees If you wait until spring to purchase a hive of bees, you have the advantage of being able to examine the brood nest. Is the queen laying a good brood pattern? Is there a good population of bees? Do the bees have enough honey stores to carry them through a period of drought? If you can not answer these question, find someone to take along with you who can answer them.
- Condition of the hive Usually the hive will not be made of new boxes or frames. Frames that contain comb which is very dark and black are old. Older frames will often have damage from mice at one time, and the bees fill in the area of the comb eaten away by the mice with drone cells. Frames like this will need to be replaced. Boxes, lids, and bottom boards my also need to be replaced before long. Wood that is not protected by a good coat of paint will rot in time. This happens to the bottom board first because it comes into contact with the ground or blocks it rest on.

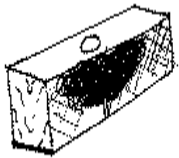
*The major advantage is that you do not need to do much. The major disadvantage is you could be buying some else's problems.*

## 2) Nuc's

A nuc is nothing more than part of a hive of bees. It does not come in a full size hive body. Often nuc's are sold in cardboard boxes which provide a temporary shelter for the bees. The nuc will have a laying queen (usually a young queen), several pounds of bees, drawn comb in which the queen is already laying eggs, some honey and pollen stores and is roughly four weeks ahead in development than a package of bees would be. The bee population in a nuc will not decline because new bees are emerging to replace worker bees that die. The hive made up with a nuc will develop much faster than a hive made up with a package of bees.

*The major advantage is that you get a quicker start with a nuc than with a package of bees. The major disadvantage is the possible spread of disease carried on the frames of the nuc.*

## 3) Package bees/ swarms



I have included both package bees and swarms together for one obvious reason: They both develop at just about the same rate. Package bees are ones which are shipped in screen wire cages for the purpose of starting new colonies. They are sold as 2 pound, 3 pound, and 4 pound packages with the 3 pound package being the most popular.

Swarms on the other hand are found hanging in a tree or on some other object such as parking meter or maybe even a car. Usually they are free for the taking because the person who owns the property wants them gone. At one time swarms were plentiful but no more due to the mite death of many of the wild bees that populated trees in our cities and forest. They do occur though and you might contact your local fire department and let them know that you would collect such a swarm if the fire department is notified by a worried property owner.

*The major advantage of starting a package of bees is: 1) you know that your bees are disease free, [bees shipped in packages must be state inspected at the point of origin] 2) you can install them into new equipment to insure that disease is not transported from other comb, and 3) you can follow the development of your hive of bees from its very beginning thus learning more about the development of a hive. The major disadvantage is the new colony is going to take more time to develop and most likely produce little honey the first year.*

## The Modern Hive

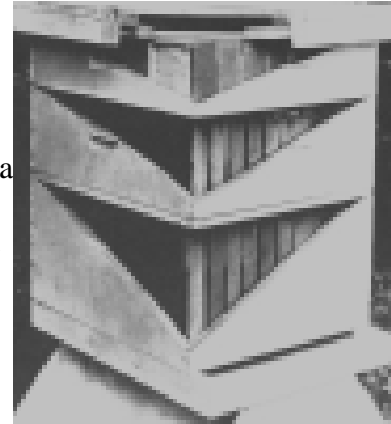
At one time, honey bees were kept in a number of shelters. These included:

- Skeps like the one shown on the left.
- Logs often called bee gums which were cut from trees and set upright on a base to which was added often a box on top to gather the honey.

- And a number of other containers such as jars. You may want to check out an interesting book titled, "*The Archaeology of Beekeeping*" by Eva Crane to see other examples.

In 1853, the Rev. L.L. Langstroth published a book called "*The Hive and the Honey Bee*" which changed beekeeping in a very profound way. This book describes the use of the modern bee hive as we know it today. The Langstroth bee hive is now the standard bee hive used in many parts of the world.

Shown here is a cut away view of the inside of a Langstroth hive. Shown is a bottom board on which the boxes sit, a bottom deep hive body called the brood chamber, a queen excluder to keep the queen in the brood chamber, a medium honey hive body called a "super", and a comb honey section hive body called a "comb honey super". Above the comb honey super is an inner cover and a top cover is placed over everything to protect the hive from weather. Within the hive boxes are removal frames that hold the comb built by the bees. We will discuss each in just a little bit.



What makes this hive so remarkable is not that Langstroth discovered hanging frames (that was done earlier), or that he used a box to put frames into (that was done earlier as well). Langstroth recognized that bees failed to build burr comb between a space of 1/4 to 3/8 of an inch. If the space was smaller the bees would use propolis to glue it up, and if it was larger the bees would build comb into the space. Thus we as beekeepers must use equipment that recognizes this natural habit of the bees to provide that "bee space" as it is called. Thus frames in a box must be at least 1/4 of an inch from the side of the box and not more than 3/8 of an inch from the side of the box. The space must also be provided between boxes, and the inner cover. If this space is violated, the bees will cement everything together, making it very difficult to remove frames for examination, or the removal of boxes.

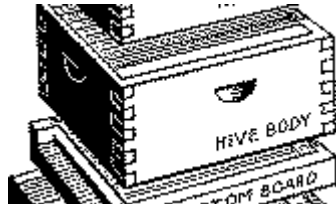
Although all the equipment needed to build a bee hive can be done in a wood shop, we would recommend that the beekeeper at least buy a box "super" to use as a pattern. It is very important for everything to be of a standard size. Else where in this site are plans to build bee equipment. Today the 10 frame hive body is considered standard. There are other sizes, but when you begin to have 8 frame equipment, or 11 frame equipment, you will suddenly find that parts are not interchangeable. Stick with 10 frame equipment. It will resell much better than any of the other sizes.

### Each part of the bee hive explained:

#### The Bottom Board

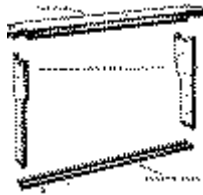
We are going to start at ground level and move up. The bottom board supports the hive. It is the floor of the hive with a 3/4 inch rim around three sides to allow the bees to enter the hive. It also extends 2 inches in front of the boxes to provide a landing board for the bees. Here bees take off for the fields to gather nectar and return to be met by other bees, called guard bees who check to make sure the arriving bee belongs to the hive. Bottom boards must be strong to hold the weight of the hive. They must also be

well protected against rot. Because it is close to moisture in the soil, it is the first to show any sign of decay or rot. Another piece of equipment associated with the bottom board is a hive entrance reducer. The purpose of the reducer is to restrict the entrance so a weak hive can defend itself and is installed in the fall to reduce damage from mice and prevent drafts from blowing wind.



### The Hive Body

The standard 10 frame Langstroth hive body will vary from dealer to dealer. The inside dimensions are critical. Depending on the thickness of the wood, the inside dimensions are: 9 19/32 inches from top to bottom, 14 11/16 inches from side to side for the front of the box, and 18 5/16 inches from side to side for the side of the box. A rabbet is provided on the top side of the box fronts for a resting place for the hanging frames. A great advantage of this type of hive box is that more boxes with the same dimension can be stacked one above the other and the bees will move up into the upper boxes and store honey there.



### Frames

The purpose of the frame is to hold the comb made of wax securely within the hive box. A frame is made of up a top bar usually 1 1/8 inches wide and 19 inches across the top. It is notched for the end bars. The end bars can be of various depths. If the end bars are 9 1/8 inches they will go into a deep hive body "super". If the end bars are 6 1/4 inches they will go into a medium hive box "super". If the end bars are 5 3/8 inches they will go into a shallow hive box. Notice that I have been using the term "super". Beekeepers usually refer to boxes as supers. The bottom bar can be either solid or split. If you are buying frames in a catalog, you will need to know the size of box the frames are going to go in before you buy the frames.



### Foundation

Foundation is what the bees build wax comb on. Foundation comes in many sizes and thickness. Usually we have thought of foundation being the wax sheet with starter cells pressed into the wax. Things have changed. You can still buy wax foundation in all sizes. It even can be bought with supporting wire embedded in the wax. If one is working with wax foundation, it has to be placed into the frames. You would need to have frames with a top bar that has a removable wedge. You would also need a split

bottom bar. The wax foundation is held in the frame by fastening the wax sheet to the top bar with the removable wedge. The split bottom bar holds the wax sheet at the bottom of the frame. To hold the foundation straight in the frame, a beekeeper usually uses cross wires stretched from the end bars and embedded into the wax.

However, many beekeepers are turning to plastic foundation. The ad shown above for plastic foundation gives you an idea of the various sizes and choices one has when selecting it. One can buy one piece plastic frames which include the foundation. No work at all in getting them ready for the bees. Just put them into the hive box and you and the bees are ready to go. Plastic foundation is also made for wood frames. Every beekeeper has an opinion on what is best. Our advice would be for the new beekeeper to try both. This way you can also learn to develop knowledge and prejudice toward which you favor.

What happens if you don't use frames and foundation in a box? I was hoping that no one was really thinking this way but here is the answer. The bees build a mess in a hive body. This is not much better than the skep of old. One can not inspect or examine a box that has no frames in it if the bees have filled the box with comb. Believe it or not, but I have seen this situation occur to new beekeepers who were just too busy to build frames to put into their new hive body. You need to put frames into the box.

#### Queen Excluders

A big question often discussed at bee meetings is "Do you really need a queen excluder?" Again, you will find individual beekeepers who like or don't like them. They are often called honey excluders because bees don't like to go up into the supers above through the queen excluder. The purpose of the queen excluder is to keep the queen in the brood chamber so the queen doesn't lay eggs and thus have brood in the honey supers. It is almost mandatory to have queen excluders on bees when you are producing comb honey for sale. Queen excluders can be purchased with a wood rim around the metal excluder or one can buy all metal excluders. They even come in zinc and plastic.

#### Honey Supers

These are the boxes with frames and foundation for the bees to store surplus honey. They come in four basic sizes.

- The shallow 5 3/4 inch super that uses 5 3/8 frames.
- The medium (Illinois) 6 5/8 inch super that uses 6 1/4 inch frames.
- The deep 9 9/16 inch super that takes 9 1/8 inch frames
- Comb honey supers\*\*

\*\*Comb honey supers are 4 3/4 inches deep. They require special supplies to produce the comb honey. The beekeeper has the choice of the old standard section boxes that require section holders, separators, flat tins and springs. Or the beekeeper can use what are called "Ross Rounds". In a Ross Round super the bees build comb into round section rings. Our advice to a beginner is to pass on the comb honey sections until you have a year or two experience. It takes strong bees and special management to produce good comb honey sections. If you really want comb honey, a easier way is to use the standard shallow frame with thin wax foundation and when the bees have capped the honey in the frame, you can cut sections of it out and put it into freezer bags or jars. One will find



clear boxes or cut comb honey trays in the bee catalog which can be used to sell cut honey.

#### Inner Cover

The inner cover does several things. First it provides a dead air space for insulation against heat and cold. Second it prevents the bees from gluing the top cover to the top bars of the super under it. With an inner cover, the top cover is easy to remove from the hive. One other advantage that comes to mind is the hole allows bees to reach emergency food if it is required. Granulated sugar can be poured onto the inner cover near the hole and the bees will be able to get to it during even the coldest of days.

#### The Top Cover

This is a cover that fits on the top of the hive. In the north, the cover is usually one that telescopes down around the inner cover and an inch or so down over the top super. This is called a telescoping cover. Many commercial beekeepers use what is called a migratory cover. This cover is a solid cover that does not extend beyond the sides of a hive body. The reason for this is the bee hives are usually on a pallet and the hives on the pallet are set against each other - side to side. There is no space between the hives for a telescoping cover to fit down into.

#### Equipment and things needed to Manage Honey Bees

##### Protective Clothing

A well protected beekeeper will continue to enjoy the benefits of keeping bees. One can get along with clothing that you already own or you can spend big dollars for a complete bee suit. One thing that you will need is a bee veil. We would suggest that you check out bee catalogs for the variety that is available.

Contact these dealers for their newest catalog.

The basic protective equipment is:

- Bee Veil
- Hat
- Gloves
- heavy shirt (long sleeved)
- heavy long leg pants
- high top shoes or put pant legs into the top of socks.

Honey bees will crawl and usually find any opening that may exist in the clothing that you are wearing. Most often, they climb up the inside of the pant leg if nothing prevents them from getting there. Bee supply firms sell leg straps as well as leggings. If you can

afford the cost of a complete bee suit, you will be rewarded. As you become more confident in working your bees, you can dress down to something more comfortable.

#### Tools

Every beekeeper needs tools to work with.



- The foremost tool is the smoker. As indicated this produces smoke to subdue the bees. We will discuss using the smoker later.



- A tool to pry open the hive and remove frames. This could be as simple as a screw driver but most beekeepers have a handy hive tool around. It is also good for scraping.
- A roll of duct tape. This comes in handy sometimes.

As you read through bee catalogs you will see many things that seem to attract your attention. Some items are useful and others are just a waste of money. I often see bee brushes offered with beginner hives. If you really want to piss off a bunch of bees, just try brushing them. If you want to get bees off of a frame, it is quite easy to take the frame and with a quick downward motion with a sudden stop causes many of them to fall off. Another item that I see quite often is something called frame grips. As you can see from the picture, frame grips are used to pick up a frame from the hive. Maybe beekeepers buy these things because they do not have to come too close to the bees. You will still need to use the hive tool to loosen the frame in the hive in order to lift it out. Why not just use your gloved hand to grab hold of the frame and lift it out. That way you can view both sides of the frame and the bottom of the frame! If you will be looking for your queen, you will have to do exactly that.

Things that would be nice to have but you can get along with out them:

- A bee tight work room
- Electric Hand uncapping knife
- An extractor
- A storage tank for honey
- Some honey jars or honey containers (5 gal. bucket).
- Woodworking tools - Electric saw, hammers, etc.

A location to put your bee hive!

You will need a location for your hive. Where to put the hive is a question new beekeepers must deal with. Consider the following:

- Do not put the hive on the lot line facing your neighbors property. Even if you don't like your neighbor!
- Locate it so that it get early morning sun. A southern exposure is often recommended. However, on very hot days the bee hive needs some shade. Shade helps the beekeeper as well when working the hive during very hot weather.
- Do not place the hive in a location where there is going to be a lot of foot traffic.
- Most areas do not have zoning laws against keeping bees but some do. Check your zoning laws.
- You can keep bees at a location on someone else's property. There are many local farmers who desire bees for pollination.
- Do not keep more than two hives on a city lot. You could stretch it to three but not many more than that. Use common sense.
- Don't work your bees while the neighbors are present.
- Make sure anyone with you is wearing protective clothing.

### **Our First Year of Bee Management**

Moving a hive of honey bees:

The first topic under management that we are going to discuss is how to move a hive of bees. I include this topic here first because some of you may purchase a complete hive of bees and that hive must be moved from the sellers property to your location.

You should be aware of the fact that bees almost always return to their own hive. When a young bee (about 20 days old) first leaves the hive, she takes an orientation flight. She will fly about in front of the hive -- fixing its location in her navigation system. If you move the hive just a few yards away, the honey bee will return to the exact spot where she knows her hive should be. In fact, all the field bee "the bees that are out looking for water, pollen, nectar, or propolis" will return and fly about very confused over and around the spot where the hive was located. Certainly you would think that they would discover their own hive just yards away. These "lost" bees will enter any box that looks like a shelter placed on that old location. It could even be a cardboard box. Or if the hive was sitting under a tree, the field bees may gather on a low hanging limb close to where the hive had been. If their hive is only a few yards away, they will eventually work there way to it. This interesting fact can be used in your management of bees.

First, if you have a very weak hive and you would like to make it stronger, you can just swap positions with a strong hive. The bees from the strong hive will then enter the weak hive there-by increasing its population. It is said that bees will fly up to two miles from their hive to gather nectar. Some studies show that bees will fly even further.

How does all of this affect moving bees? If you are moving bees to a new location which is more than two miles away, no problem. If you are moving the hive to a location much less than two miles, you will lose all of your field bees because they will return to the old hive location.

What can you do? If you want to move your bees only a short distance from where they are now, it would be best to move them to a location several miles away first. Leave them there for a week or more. After they get used to the distant location, you can then move them without the loss of the field bees to your new location.

Tips on moving a hive of bees:

- Night is the best time to move a hive of bees. All the bees are inside then.
- If the weather is cold, you can completely seal the hive by taping and blocking all escape holes.
- If the weather is warm, do not seal the hive entrance. Use wire screen wire in the shape of a "V". Slide the pointed "V" of the screen wire into the hive entrance to keep the bees in but allow air passage.
- Prepare the new location by putting down blocks for the new hive to sit on. Keep it off the ground to avoid moisture rotting the bottom board.
- Staple, crate, or tie the hive in advance of moving it. There is no experience like the one you will have if the bottom board drops off during the move to the vehicle and you are forced to walk through thousands of bees that fall to the ground.
- Make sure the hive is securely fasten or tied down in the vehicle you are using to move the bees.
- Avoid quick stops. Drive defensively.
- Do not leave the bees in or on a vehicle until you get up in the morning to locate them. Do it when you get them to the site.
- Remove any screen wire used to block the entrance. Remove any block used to seal the entrance. The bees must have air circulation and they must be able to fly.
- One final important step::::: Check to make sure the queen survived the move. This should be done four or five days after you have moved the hive (spring, summer, and early fall). If you wait at least four day and you see eggs in cells, you have a queen. It takes eggs three days to hatch into larva. If you see no eggs, then you have a problem.

Management of bees:

We are going to assume you have your hive of honey bees started. As your bee colony grows, it will be necessary to add more boxes "supers" for them to expand into. If bees become crowded and there is not enough room for expansion of the brood nest, the bees will swarm (fly off in large numbers along with the queen to start a new colony). The

loss of a swarm may leave the remaining colony too weak to store surplus honey for the winter.

When a hive swarms the queen leaves with the bees but before leaving, she lays eggs in special cells called queen cells. These cells (20 or more of them) will be located at the edge or bottom of the frames. What can you do if you see queen cells?

1. First, you can try to cut all of them out and this must be done every six or seven days. Once bees start building queen cells, it is hard to stop them from building more.
2. You can give them more room by putting a new super on the hive. This doesn't always work.
3. You can take several frames with queen cells on them and start a new hive. The new queens will emerge, fight, and the survivor will mate and begin to produce more brood. Don't use this method after mid July. Add new brood frames to the old hive and cut all remaining queen cells.
4. You can clip the wings of the queen so she can not fly. When she tries to leave the hive with the swarm, she will be unable to fly and can usually be found on the ground in front of the hive. The swarm without a queen will return to the hive and wait until one of the virgin queens emerges and take off again with her. The bees will swarm before this new virgin queen emerges (hatches- is an incorrect term). If you again go through the hive and find queen cells, you can destroy them and put the old queen back into the hive.
5. The best thing you can do is just make sure your bees do not reach the critical point of being too crowded.

Hive inspections:

A beekeeper should know what his bees are doing. You should examine the hive every two weeks to make sure they have plenty of room, that the queen is laying eggs, that they are storing honey, and that the bees are free of disease. Beekeeping 201 has information about diseases.

You should also keep a notebook of your observations. They will become important as years come and go. Every bee year seems to present us with something different. Your notebook will provide some means of comparison. Our memories seem to fade and are not as reliable as notes taken at the time an event occurs.

How to open and examine your hive:

You should always wear protective equipment when you work your hive.

You should light your smoker before getting started. I have often been asked how I keep my smoker going. Seems some people have smokers go out just about the time they need them. The key is to take time to get the smoker going before rushing off to the bees. There are many types of smoker fuel. I can remember learning how to build a fire as a boy scout. Start small and then add new material slowly to the fire. Don't dump a lot of smoker fuel onto a newly started fire. You will smother the fire and it will go out. The goal is to have a good cool flow of smoke when you press the bellows on the smoker. One other thing, inspect the hive during the mid part of the day. Select a day when the bees are flying and seem very busy. Avoid cloudy overcast days or days with threatening weather. Bees can be really nasty during stormy weather.

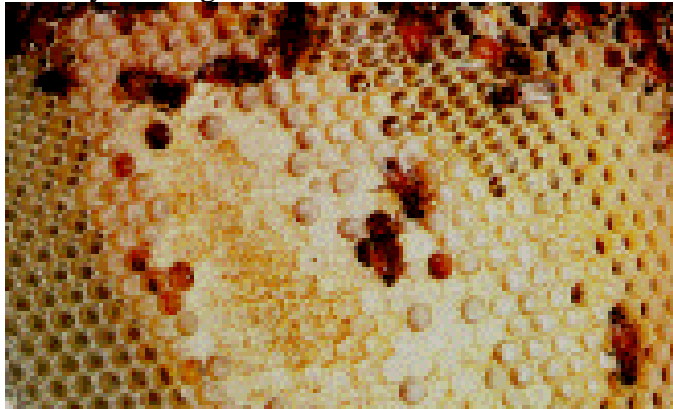
- First, make sure all is ready. Do you have your hive tool? Is the smoker going? What about neighbors? Children?
- Approach the hive from the side if possible. Do not stand in front of the entrance. If you do, you will notice a crowd of bees in a holding pattern behind you.
- Use your hive tool to remove the top cover. I like to lay the top cover on the ground next to the hive with the bottom side up. Blow a little smoke toward the entrance. Notice that I said a little smoke. You don't need a lot.
- Next remove the inner cover. Bees have a tendency to glue this down to the inner side of the hive with propolis, so you may have to pry the inner cover off. Keep your smoker handy.
- Once the inner cover is off the top bars of the frames in the top box (super) are exposed. Bees will start to migrate toward the disturbance and you will notice them coming up between the top bars. You can apply a little smoke to calm them down. A few may become air borne and fly about you. Ignore them.

Now What?

What are you doing in the hive? Do you know?

- Move slowly -- avoid quick sudden movement.
- Don't spend a lot of time with the hive open.
- Since this is a new hive, you could or should be looking for:

1. Are the bees building new comb on the foundation you put into the hive? New comb is nice and white or slightly yellow. See the photo below.
2. Are all frames drawn out? This depends on how long the bees have been in the hive. If the comb is drawn out (the bees have made new comb over the foundation), do you have a new super to add to the colony? I like to add a new super when 3/4 of the comb is drawn out. The last frames to be drawn out are the ones on the outside of the hive body. The bees will instinctively store honey in these outside frames. Don't take it away from them.
3. Can you recognize brood?



It will be located in the center of the frame of comb. It is tan to dark brown in color. It may be hard to see eggs especially in new comb that is demonstrated above, but you should learn how to spot them. They look like little spots of sugar at the bottom of cells. Larva is easier to spot -- they look like pearly white worms coiled within a cell. The capped brood is brownish in color. Older comb turns dark in color. This is because of travel stain and also brood raised in comb turns the comb dark--sometimes almost brown/ black. If you can see eggs you do not need to find the queen to know that you have one. One exception is with a laying worker which is described in Beekeeping 201.

4. Can you recognize capped honey? Capped honey will be found in an arch across the top of the comb. If it is unsealed, it will be a liquid. When sealed, the cappings are a distinct whitish color. You will also see cells that have a yellow or brownish substance in them. These cells contain pollen. A normal hive will have most of the frame filled with brood, a small arch of honey at the top of the frame and some pollen stored between the two. It is not unusual to find a frame which is almost all brood in a strong hive.
5. Get ready to close the hive if you are satisfied that all is well. If you have a feeling that all is not right with the hive, you can email

me with some photos and I will try to give you information based upon what I am able to see.

### Late Summer Honey Bee Management

It is not unheard of for a package of bees put on new foundation to have surplus honey. A number of factors determine the amount of honey a hive of honey bees can gather.

- Favorable weather
- Nearness of nectar honey plants
- Your management of the bees
- How much you feed your new colony to get it going
- The honey bee population of the hive

### Favorable Weather

Favorable weather is important. People who have kept bees over a period of time can tell you that honey crops fluctuate from year to year. Bees do much better when the weather is warm and dry. Cold wet weather keeps the bees in the hive. They must be able to go out of the hive in order to gather a honey crop. Bees also need to eat and when the weather is cool and wet, the bees just maintain themselves (use what they gather with out storing much surplus). It takes one frame of honey and pollen to produce one frame of bees. How much honey and pollen a hive uses during the year to produce brood depends on the quality of the queen. A very productive queen will lay a lot of eggs. These eggs need feed. On the other hand, if the bees have ample nectar supplies and can fly on a daily basis, the large population of bees produced by the hive will also result in more honey being brought back to the hive.

### Honey Plants/Honey

For the bees to produce surplus honey, they must have a nectar source. Bees are known to fly up to two miles or more to find nectar but if nectar sources are close to the hive, less time is spent flying to get the nectar and a honey bee can make more trips to forage for nectar in a day's time. Commercial beekeepers place hives in honey locations. A honey location can be identified as a place that has acres and acres of a plant that produces nectar in large quantities for the honey bee to gather. One example is the miles of Yellow Sweet Clover that exist in some areas of the U.S. Commercial beekeepers often tell of hives that gather an average of 200 pounds of honey or more per hive in an area like this. On the other hand, many beekeepers are limited to their back yards and the bees are limited to the area that extends two miles out from that yard. As a result, most hobbist beekeepers have hives that gather 30 to 50 pounds of honey per season. If the area is a good area, the bees might bring in 100 pounds of surplus honey. Honey is sold



to producers in bulk. Usually the prices for honey listed in the bee journals are for such sales. If the price of honey is .65 cents a pound then a hive that gathers 100 pounds would be producing a return of \$65.00. If you spend \$250.00 on equipment, bees, and protective clothing / tools, you are going to need to keep bees for a number of years before you see any return on your money. This is why it is so important for commercial beekeepers to have the right bee locations. Or you could bottle and sell your own honey for a price equal to or greater than the price charged by supermarkets. Your honey would offer the consumer a much better deal because your product is local -- has local pollen in the honey -- is not heated -- is not filtered to remove some of the more healthful particles such as pollen-- has a taste that most people can identify as honey from your region -- they will know you and come to depend upon your quality.

### Management of Hives

Much of the planning that goes into producing a honey crop has to do with timing. Did you get your honey supers on the bees at the right time? Are your bees strong when the honey crop is to be gathered? Are you inspecting your hive for swarming? Do you have a productive queen? All of these things are the duties of a beekeeper that wants to get a honey crop.

### Feeding a New Hive of Bees

Feeding a hive of bees especially one just started on new foundation helps the bees immensely. They need to build new comb, raise brood, and store food for those days they can not get out to gather nectar. However, there will come a point when the feeding should stop. I have been asked, "Why not let the bees convert the sugar syrup into honey? First, if you feed the bees and they do convert the sugar syrup into honey -- you will have adulterated honey. The sugars that make up the honey will not be honey sugars. Second, these sugars from cane or sugar beets can be identified if they are put to scientific test. Third, it is illegal to sell adulterated honey as pure honey. Why not just go out and mix corn syrup with honey? It is the same thing. It is a degraded product! When a nectar flow is on and you need to add additional supers, the feeding should stop. The bees will then store pure honey in the comb they build on the foundation you provide. Pure honey is a wholesome food and has an outstanding reputation. Don't mess it up. Quite frankly, most bee books don't even touch the subject of feeding bees too much

### How and When do I get "Surplus" honey?

A hive of bees stores honey for a reason. They put it away for later use during the winter season. Honey bees do not hibernate. They remain active even on cold days. It is estimated that a hive of honey bees will consume 60 to 90 pounds of honey during the winter. You will notice during warm days during the winter season that bees will leave the hive to take a flight. This is necessary because the bee holds it's waste until it can leave the hive to get rid of it. Honey bees do not generally defecate in their hive.

You must leave enough honey for the bees to survive the winter season. As a beginner I would suggest that you error on the side of leaving more than not enough honey. A new hive should have at least a double brood chamber with one of the boxes completely full of honey and the lower one should have the outside frames filled with honey.

### When is it time to remove the honey?

Honey can be removed from a hive almost anytime provided that the honey is fully capped over. Capped over means that at least 7/8 of the frame has been capped (that is the wax covering the bees put over the cell that holds the honey). If you try to take unripe honey (honey in cells not capped over), you will run into a serious problems with your honey spoiling because it has too much moisture in it. Discussion on this are found in Beekeeping 301.

Most beekeepers remove honey just before Labor day or shortly after Labor day. It can be done later, but extracting (taking the honey out of the comb) is difficult when the temperature turns cold and honey is stiff and will not flow well. It is necessary in that case to warm the honey supers to 80 degrees or so before extracting. Even then the honey will not flow as well as if the temperature of the honey at extracting time is 90 degrees. The cardinal rule is: Always leave enough honey for the bees!! Take only what they can spare!

### Taking off honey supers and processing honey

One of the joys of keeping honey bees is the reward of having some of your own honey. It is not "store bought."

A beekeeper must determine just how much honey he/she can remove from the hive and still leave enough for the bees to over winter. We have indicated earlier that at least 60 pounds of honey should be left on the hive. You can estimate this amount by checking the honey stores in the brood chamber. A deep frame full of honey will weigh approximately 6 pounds. The bees will need 10 of these. Two shallow frames will equal one deep frame.

### How to take the honey supers off the hive

You will follow the same procedures you have used to examine a hive in the past. One can remove honey supers and get the bees out in several ways. Mentioned in bee books is a method called using bee escapes. This is nothing more than placing a bee escape in the hole of the inner cover. Then move the inner cover under the super of honey to be removed. Wait until the bees leave the super (Several days), and remove the honey super. This works better when the days are cooler.

Another method involves using a liquid chemical to drive the bees from the honey super. It works much faster. One can either make or buy a fume board. This like a top cover placed over the honey super. The chemical is sprinkled on the cloth inside the fume board and then set on the bee hive. All you need to do is remove the hive cover, inner cover and position the fume board in place. One bee catalog describes this chemical as "pungent." It does have a distinct odor! The chemical forces the bees off of supers in 3

to 5 minutes if the fume board is working. If you leave it on too long, you can drive the bees right out of the hive. The chemicals that do this go by the trade names of "Honey Robber" and "Bee Go".

### Removing honey supers

Most of the honey bees in the supers should be out when you take the super from the hive. If they are not, you can remove each frame and shake the bees left off or brush them off. Old time beekeepers used a hand full of grass to brush bees off the face of the comb. It is free and works just as good as a bee brush. It is necessary to protect the super from robbing honey bees. Take the super to a secure place (i.e. to your basement, kitchen, etc. where honey bees can not get to it).

Bees are attracted to honey! In human terms, it would be like a paper bag of money you had just broke open on a busy street corner and your money was blowing down the street. People would swarm to gather it up. This is called "robbing".

One other word of caution:: Honey is sticky. When supers are removed from a hive, comb is often broken and the honey that was in that comb begins to drip and leak. Putting the super in a plastic garbage bag will contain the honey to the inside of the bag and also prevent bees from getting to it.

### Processing the honey

One of the early things you should be thinking about when you purchase your hive equipment is what are you going to do with the honey the bees gather. You can spend a lot of money on equipment to extract honey or you can decide that you want to wait to see if beekeeping works out before you invest much money in any kind of extracting equipment.

As a beginner, you most likely are not expecting a great amount of honey from your hives of bees the first year. Maybe enough for your own table and as gifts to friend and neighbors. I am going to suggest two methods you can use that do not require extracting equipment. If you are interested in extracting honey, you can move on to Intermediate Beekeeping 201.

#### Method #1 Plastic frames with plastic foundation

You can get honey from plastic foundation after the bees have capped the cells of honey on it. In fact it is rather easy. All you need to do is scrape the honey from the foundation -- wax comb and honey all come off easily. The hive tool is great for doing this. The procedure is: 1) secure a fair sized container to hold the wax and honey; 2) get a filter cloth (Cheese cloth will work and so will paint strainer sacks sold by paint dealers); 3) select a place to work which is clean; 4) get the super and remove a frame to begin the process.

The process is to take each frame and with the hive tool or paint scraper, place the tool at the edge of the frame end bar and press the tool into the wax. With a pushing motion,

the wax and honey will curl right off the plastic mid rib and fall into the straining cloth which is draped over the container. The straining cloth will allow honey to pass through while keeping the wax inside the straining cloth. A great amount of honey will remain in the wax and this can be partly removed by squeezing the remaining particles until most of the honey is out. After you have most of the honey out, you can mix the remaining wax with water. This will clean up the wax and remove the honey that still remains in the wax. This water can then be used as feed for the bees. We will discuss processing your wax in just a little bit. Another advantage of this method, is: the frames can be used again in the super and put right back on the hive it came off. The bees will clean up the frames and you can reuse them again the following season. The filtered honey can then be bottled.

#### Method #2 Cut comb honey or chunk honey

Again the decision must be made early. In this case, you will need wooden frames and what is called thin super foundation for comb honey to put in the frames. The bees will draw out this foundation and cap the honey they store. This process will give you honey in the comb. This is a delightful way to use honey.

We would suggest that you make or buy a pan a little larger than the frame you are going to use. The Walter T. Kelley Co., makes a comb slicing pan for under \$20.00 that is a delight to work with. You will also need something to put the comb into -- sealed plastic bags work as do jars. Special containers are sold for cut honey. And you will need a knife to cut the comb out of the frame.

You can cut the comb to almost any size that you choose. Generally, the special containers are sized so you can get four sections from one frame. You can put comb in a jar and pour the extra honey drippings into the jar around the comb.

#### Processing wax

Another product of the hive besides honey is wax. It is used in candle making and other things. There is a delightful book written by Elaine White titled "*Super Formulas - How to make more than 360 useful products that contain honey and beeswax.*" If you are interested in making things from wax, you should seek out this book. It was still available from the Walter T. Kelley Co., at this writing.

Before you go any further, I must caution you about working with wax. It is very flammable. We would suggest the following method:

- Do this outside to avoid a wax spill or a fire.
- If you have a charcoal grill, or some other controllable source for heat, get it started.
- Select a pot - stainless steel is best. Do not use iron because it will discolor your wax.
- Pour water into it. Half full is enough. You do not want the contents too near the top of the pot.

- Place the wax particles you have saved into the pot. If you have a lot of wax, try doing several batches rather trying to do all at one time.
- Wax melts at about 148 degrees F. Do not let the wax and water boil.
- Once the wax melts and becomes a liquid, it will float to the surface of the pan. The water is heavier and will remain below the wax.
- Take the pan off of the fire, and allow it to cool overnight.
- The next day, the wax will be a solid block and can be separated from the water.
- On the bottom side of the block of wax will be dark material that is not wax. This is called "slum gum". Slum gum does contain some wax and this wax can be removed under pressure and heat in something called a wax press. But with the amount of wax you will have, this will not be cost effective. You will need to scrape the slum gum from the bottom of the block.

If you are disappointed in the quantity of wax you have recovered, save it and add to it next year.

### Some characteristics of honey

Pure honey will last a long time. It does darken with age however. The two characteristics of honey we would like to discuss are 1) Fermentation of honey and 2) granulation of honey.

### Fermentation of honey

Honey is hygroscopic which means that honey will absorb moisture. If the moisture content of honey exceeds 18.6%, honey will tend to ferment. The fermentation yeast in the honey will turn the sugars of the honey into alcohol. This causes honey to have a sour taste. It is recommended that if honey is to be stored for any length of time, it should have a moisture content of around 17%. The honey yeast are not able to grow at cool temperatures. So if honey is stored at below 50 degrees F., the yeast will not grow and are not able to grow and cause fermentation. Fermented honey can be feed back to the bees but it is unfit for human consumption. Honey can be frozen and that is a good way to keep honey for long periods of time. The optimum temperature for honey fermentation is above 80 degrees F.

### Granulation of honey

All honey granulates at some point. That is: it becomes a semi solid sugar like substance. Honey that has granulated can be returned to a liquid state by heating it. So it should not be considered a serious problem. Granulated honey in jars can be put into a water bath having a temperature of 95 to 120 degrees F. Honey is darkened each time it is subjected to heat. If honey is heated to over 160 degrees F. for any period of time quick damage can be done to the honey. The taste will be changed and the color will darken considerably. Commercial honey packers usually heat honey to 160 degrees and

then rapidly cool it. This causes the death of the yeast and reduces crystallization for several years -- giving the product long shelf life on the grocery stores shelf.

### Getting your bees ready for winter

Begin to think of fall management as the beginning of a new bee year. Things you can do in the fall will reduce problems you may face in the spring.

There are several tasks that need to be taken care of in the fall after the honey is removed:

- First, an inspection of the hive is in order. The hive should have ample supplies of honey stores, a good population of bees, and the queen should have a good brood pattern rather than a spotty one. Disease is a concern, but if you started with package bees and new equipment, it should not raise its ugly head (American foulbrood). However, you should know what to look for. Check *Intermediate Beekeeping 201* for diseases.
- Second, fall management to save your hive involves doing several things. a) Level your hive making sure the hive slopes slightly in the front so water does not run back into the hive from the landing area of the bottom board. b) It is time to use miticide strips to control Varroa. Check the catalogs for products and follow directions on labels. More hives die from mites than any other reason. c) Place an entrance reducer at the front entrance. This keeps mice out and winter wind damage at a minimum. d) Provide the bees with a wind break. e) Make sure the hive has good ventilation. Air has to move about within the hive so that condensation does not collect and fall on the bees. f) feed the hive with sugar syrup mixed 1:1 if they do not have enough surplus honey to carry them through the winter. This should be done before it gets cold.
- Third, fall is a good time to replace a failing queen. Don't wait until spring.
- Finally, if you have done all you can, don't disturb the bees during really cold weather. I know you want to know if your bees are still alive but please wait until you can visit on a warm day. Bees will fly during the winter on warm day and on a day such as this, you might open the hive and check bee activity and get an idea of the number of bees in the hive but don't go looking for the queen. The bees need to conserve as much heat as they can. You can only do damage to the hive.

As winter sets in, you can continue your growth as a beekeeper by reading books. One book that should be in every beekeepers library is the most recent issue of *The Hive and the Honey Bee* published by Dadant & Sons, of Hamilton, Illinois. It is absolutely the best book you can buy to get the latest and best from experts on beekeeping. Each chapter is written by a recognized authority. If you haven't subscribed to a bee magazine, you should. The two most popular are: Bee Culture published by the A.I. Root Company and the other is The American Bee Journal published by Dadant & Sons. If

you are computer literate and you most likely are because you are reading this, explore the many bee web sites. The amount of information is just overwhelming.

## **The Beginning of your second year**

The biggest question that beekeepers have when spring arrives is "Did my bees survive the winter?" Depending upon where you live, you can check to see if your bees are alive almost anytime from January on.... Those people in the southern and south western parts of the U.S. will have bees actually flying and bringing in pollen late in January. Those of us who live in the north must wait until March rolls around for the same thing to happen. However, you can check your hive/hives before the bees begin to actively fly to gather pollen and nectar. Honey bees typically move up toward the top of the brood chamber late in winter. As they consume their honey supplies, the winter cluster moves within the hive. As they consume the honey in the lower brood chamber, they seek the honey stores stored above. Thus, it is not uncommon to find bees around the hole in the inner cover in late winter. If I see them I know they are alive but I don't know the condition they are in -- I don't know whether the queen is laying eggs -- I don't know how much brood they have -- and on the other hand, if I don't see bees, I can still check to see if they are alive by putting my ear down to the top bars and listen for the gentle hum bees in a cluster will emit. I don't recommend that you kick your hive to see if you can get a response out of them. If you hear no sound, you might want to take a hive tool and separate the two hive bodies. This is not good in real cold weather. If you have bees -- good. Your spring is starting off good. On the other hand, if your bees are dead you are still the owner of bee equipment. The comb has been drawn by the dead colony. It most likely will have frames of honey. All is not lost.

It is at this point that many beekeepers give up. I understand disappointment. But look at what you have. Unlike a year earlier, you have equipment. You have frames with drawn comb. These are assets. Any package of bees installed in such equipment will succeed beyond your wildest dream. Many commercial beekeepers buy only two pound packages for such hives. The two pounds of bees in such equipment can produce the 200 pounds of honey the commercial guys needs to survive and still pay for the cash outlay of the package that is installed in the hive.

## **Spring Management**

If your bees survived the winter, there are things that need to be done. You can get into your hive anytime the temperature of the outside air reaches 57 degrees F. You will need to carry out an early hive inspection. Things you will look for and do:

- Check the condition of the brood and the amount of brood.
- If there is no brood you have a problem -- You will need to purchase a new queen immediately.
- If the queen is laying poorly, replace her. Don't kill her until the new queen arrives.

- Check the hive for any mouse damage. Mice get into the hives during winter and build a nest in the lower corner of frames. If this has happened, remove the frames that are damaged -- remove the nest and check to make sure no mice are running around inside the hive. Check to see where the mice are getting in. Later you will not have to worry about the mice because the bees will take care of them. You can reuse these damaged frames but the bees will most likely build drone cells in the area eaten out by the mice. One advantage of plastic foundation is that mice do not chew it out.
- Clean all debris from the bottom board. It is a good idea to set all hive bodies on top of the top cover and scrape the bottom board with your hive tool and then put everything back together.
- If this hive is weak, you might consider buying a two pound package of bees. You can kill the old queen and introduce the package to the rest of the bees still in the hive. As you get more hives, you will be able to borrow frames of bees and brood from your strongest hives and make the weaker hive stronger. In beekeeper terms this is called "equalizing the brood".
- You will also want to treat your hive again for mites with chemical strips. Hopefully, the practice of putting chemicals in a hive to save the bees will soon end with the introduction of queens that are mite resistant. It appears that we may be getting stock that can hold its own against varroa mite. We have already achieved it with the tracheal mite. If you need a new queen, certainly consider the mite resistant stock available.
- Get supers ready to put on the bees but if they are not flying and the weather is cold, wait until the bees begin to gather nectar. The bees can conserve heat better without the added super.
- Another thing you might want to check would be: Are any critters bothering your bees. Skunks are a problem in some areas. Bears can be a problem (You will see the damage without any trouble). Skunks eat honey bees and once they discover a meal to be had, they will be back every night. Signs of skunk damage: the grass in front of the hive entrance will be matted down and if the skunk has been working the hive over a period of time, the grass will be worn away showing a bare patch of dirt in front of the hive. You will also find scratch marks on the front of the hive. Skunks disturb the hive and when a honey bee comes out the entrance to check to see what has caused that disturbance, the skunk will have a meal.
- You may have to re-level your hive.
- Check for hive maintenance. Does it need a new coat of paint? Clean grass from in front of the fly way. Be proud of your hive/hives. If you maintain your equipment, it will last for a long time.



## Adding supers

During the second year you can expect your hive to develop swarming fever! It is important to be one step ahead of the bees. Adding supers at the right time will prevent a lot of problems. The first super could go on the hive when you see dandelions blooming. This is about the same time apple trees begin to bloom. Another guidepost that might help you decide when to put on supers is when the maple bloom. Bees will not usually gather a honey crop from apple and maple. They will however be using the pollen and nectar for brood rearing. As the population explodes, the bees will be crowded without the extra space. Bee swarm as early as February in the south. As weather warms further north, bees will become crowded with all the nectar and pollen coming in from the maple, willow, and apple. Swarm control starts early.

Because this is your second year, don't assume you know it all. Your bee experiences are just beginning. Older beekeepers will tell you that every year has brought something different and beekeepers continue to learn. The bees have a lot to teach.

## Misunderstanding often causes trouble!

Traditional practices within the business of beekeeping lead us to give you some insight into dealing with bee equipment suppliers and breeders.

Usually when you purchase bees such as packages, there is no assurance that your bees will live. If you pick them up, it is better than ordering them through the mail. At least you can see if they are alive and healthy. Often one receives package bees by mail in which over 1/2 of the bees are dead. The package producer delivered them to the postal service alive and in good shape. During the trip the bees under go stress. It may be several days before they are delivered. During the time of shipment, a postal clerk might have put the package in a postal bag fearing that the bees might get out of the cage. Or, the bees might have been set outside on the loading dock in the full sun by postal officials who did not want them inside the post office. Or worse, put into a delivery truck with no ventilation. Who do you blame? Usually the bee package producer! Shippers of queens and packages are facing an industry crisis. The postal service does not want to handle packages and queens. UPS (United Parcel Service) will handle bees but the cost is almost as much as the cost of the bees and they will not insure live arrival.

Bee equipment is in demand during the spring. Often one who orders equipment such as frames and boxes will find the producer is back ordered. Delays in getting equipment in the spring of the year is common. You can over come this problem by ordering early.

About the only protection you have when ordering package bees, queens or equipment is to use a credit card. At least you can challenge the charges to your card if something goes wrong. Small operations usually do not handle credit cards due to the cost involved and you should understand that. But some understanding between you and the person you are buying from should be in writing regarding what happens if the bees or queen arrive dead.

## Other beekeepers

You may find other beekeepers trying to tell you about the one and only way to keep bees. Well I must tell you that it just isn't absolutely true that there is only one way to keep bees. Every beginning beekeeper must learn -- and some times we learn by making mistakes. I like to think of myself as a sponge. I try to absorb all I can. However, I never adapt a new system without first trying it on several hives before using it with all of my hives. Beekeeping is an art not a science. A lot of science is involved with beekeeping -- science has answered questions about bee behavior etc. Science is important, but when it comes down to taking care of your hive of bees, it will be your decisions that affect the bees in your hive. How you apply what you learn and experience will make up the art of keeping bees for you.

## Bee Clubs

One way to find other beekeepers who can help you with problems you encounter is to join a local bee club or state organization. Bee Culture Magazine publishes a Who's who in beekeeping each spring. You could check the listing for the state in which you live and contact the individuals listed. Ask them for information about bee clubs and who you need to contact. The person listed under the Department of Agriculture responsible for inspection should have a good idea. They are often called upon to speak at local meetings. The State Extension service should also be a good source. If you purchase either major bee magazine -- each carries a calendar of events. You can get an idea of where the nearest bee meeting is to you. These are generally state or regional meetings.