

# CONNECTICUT BEEKEEPING

## #1 STARTING WITH BEES



**This Publication is a  
Cooperative Project of the  
Connecticut Beekeepers Association  
and the  
State Entomologist's Office  
New Haven, CT. 06504**

# STARTING BEEKEEPING

## GETTING BEES

### Introduction -

This series contains two types of instruction, basic beekeeping practices (pamphlet #1) to get you started, and detailed instruction on parasites and diseases (pamphlet #2). The reasoning behind the strategy is as follows. We want to have a pamphlet to get the beginning beekeeper started with his or her bees, but one is expected to have no success if there is no knowledge on how to control mite infestations. Tracheal mites first appeared in Connecticut in the fall of 1989. Varroa mites appeared almost exactly a year later (fall 1990). We are still learning how to best deal with the mites, and as yet, there is almost nothing published in books to help the new beekeeper learn how to control them. In fact it may be some time yet before the best methods of managing with mites become apparent for Connecticut Beekeeping.

Honey bees, like house pets and farm animals, need our care to do well and produce a surplus honey crop. The relationship between human beings and honey bees goes back many thousands of years. During that time, the honey bee, unlike most domestic farm animals, has changed very little. It is superbly adapted for the task of gathering nectar to produce honey, and gathering pollen for protein to raise new bees. Often people who have no intention of becoming beekeepers will watch a colony of bees at their labors for hours. As an experienced beekeeper, you will be able to watch their labors at close hand and reap the profit of golden honey made by YOUR bees, from flowers in your neighborhood.

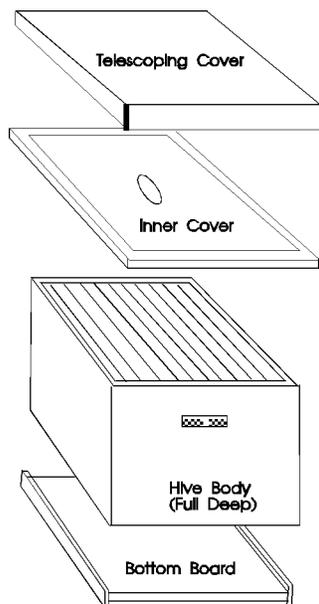
### Needed Equipment -

As a novice beekeeper, you will need the following equipment to get started:

1.) Hive, consisting of a bottom board, brood chamber, 10 frames with foundation installed, inner cover, and telescoping cover. During the first year you will have to add another brood chamber with frames and foundation, and possibly a honey super with frames and foundation.

- 2.) Smoker
- 3.) Hive tool
- 4.) Bee veil
- 5.) Bee gloves
- 6.) Bee suit

Although experienced beekeepers may not always use gloves



and a full suit, it is highly suggested for beginners. Also, if problems occur you can be fully protected. Even experienced beekeepers keep a full set of protective gear for emergencies. Optional and desirable equipment includes: queen excluders, bee escapes, and feeder equipment.

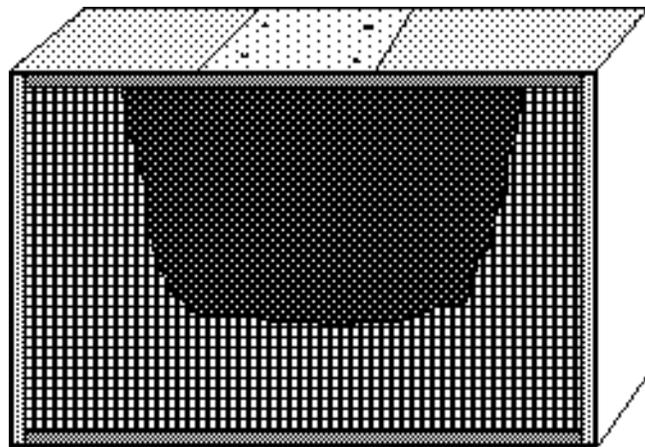
Your first bees can be purchased from bee breeders who supply packages and nucs or obtained as a wild swarm. It should be kept in mind that both wild and purchased bees can have parasites and/or diseases so preventive measures should be taken. Also, there may be quarantines in place you should be aware of. Check with the State Entomologist's Office for the current regulations and any other problems you should be aware of. Also, your beekeeper association can be a good source for information.

## INSTALLING YOUR BEES

### Installing packages -

A package of bees consists of a screened box of bees with a tin can feeder and a queen in a separate cage. It is not unusual to find up to an inch of dead bees in the bottom of the package. Often they have spent 2 to 4 days in transit and the older bees have expired.

1.) Set up the hive in its permanent location. This should be where there is good air drainage and protection from the harsh north winds of winter. The hive entrance should face south or east to catch the morning sun and also to protect the entrance in the winter.



### A Package of Bees

2.) Put your bee suit on, take the bees, smoker, and hive tool to the hive. If early in the spring, prepare some sugar syrup to feed the bees since it may a few days before they can get out to forage should the weather turn cold.

3.) Light your smoker and get a good fire in it so that it will be ready for use later. Lift the cover on the package using your hive tool. This will expose the tin can of sugar syrup which fed the bees in transit and the queen cage. Now, soundly hit the package on the ground to settle the bees to the bottom of the package so that the queen cage can be removed without many bees escaping. Immediately after removing the queen cage put the cover on the package

so the bees do not escape. The best way of doing this is to put the cover on the package upside down. The object is to prevent the bees from coming out of the hole where the queen cage was removed.

4.) Push aside any bees clinging to the queen cage to examine it for the queen. Be sure she is alive. If not, seek out a replacement queen before installing the package. The exception to this is when it will be several days before a replacement queen can be obtained. Remove the cork from the queen cage at the **CANDY END**. The purpose of the candy is to restrict the queen from escaping for 3 - 4 days while the bees continue getting used to the new queen and their new home. Next, install the queen cage with the **CANDY END UP** between the 5th and 6th frames near the top and center of the frames. A small string or piece of wire can be used to hold the cage in place. The screen on the queen cage should **NOT** be facing the foundation; it should face the entrance of the hive so that the bees have access to the queen to feed her.

5.) Now, a couple of handfuls of bees can be dumped on top of the frames in the hive above the queen, and the inner cover gently placed on top so as not to crush any bees. Your smoker can be used to persuade the bees to move down around the queen before putting on the inner cover. Once the inner cover is on put on the telescoping cover.

6.) Finally, dump as many of the bees, as can be shaken out, in front of the hive as close to the entrance as possible. Soon, the bees will start to march into the hive. The package should be left close to the entrance with the opening up. After a couple of hours the remaining bees will enter the hive.

7.) It is always advisable to put a feeder for sugar syrup on a new hive. Early in the spring, when bees may not forage for a few days, it is mandatory. If possible, pollen or pollen substitute is also beneficial. (See Feeding Bees)

### Installing Nucs -

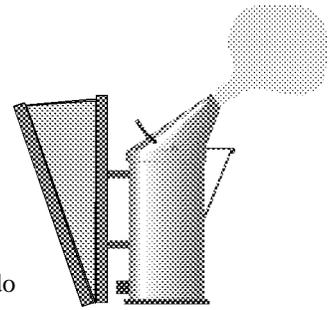
Installing nucs is far simpler than installing packages. This can make the purchase of a nuc a wise investment for the beginning beekeeper. A nuc has a mated queen with a frame or two of her brood and a couple of frames of honey and pollen to feed on if the weather turns foul for a few days after installation. The quality of a nuc can vary with the supplier but gets going faster than a package since new bees start hatching right away. Since a nuc comes with 4 or 5 drawn combs this also helps get the colony going faster. This is in contrast to a package of bees where population decreases for 21 days or more until new bees start hatching.

- 1.) Set up the hive as with package bees.
- 2.) Suit up and light your smoker.
- 3.) Transfer the frames from the nuc to your hive being careful not to injure the queen.
- 4.) Gently smoke the bees down into the frames and install the inner and telescoping covers.
- 5.) Dump any remaining bees, from the nuc, in front of the hive as close to the entrance as possible.
- 6.) Install a feeder and pollen substitute as insurance, although it is not always necessary since the nucleus colony already has stores in the frames. (See Feeding Bees)

## EXAMINING THE COLONY

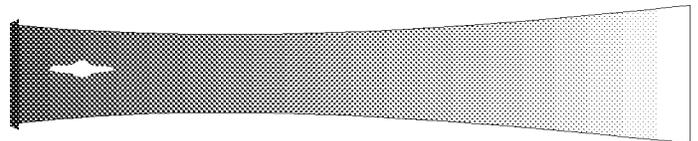
### Use of the smoker -

Fuel: Some of the commonly used fuels for smokers are tree bark, twigs, pine needles, burlap, and untreated baler twine. Beekeepers have used many different materials in their smokers through the years, do not use a material which may produce a toxic material in the smoke (plastics and materials with pesticides or rodent repellents, for example). Your fuel should be dry enough that the smoker doesn't go out when put down for a period of time and yet not burn so fast that flames come out the nozzle. A cool smoke should come out of the smoker so that the bees are not burned. Hold your hand in front of the smoker nozzle while squeezing the bellows to test the smoke.



The smoker is used for bee control. The bee's reaction to the smoke is fear and disorientation. This allows the beekeeper time to manipulate the hive before the bees get reorganized. The smoke also can be used to move bees out of an area in the hive because the bees will walk away from it. Before opening a hive, 5 or 6 good puffs of smoke at the entrance are usually sufficient. Too much will make the bees angry again. A couple of puffs of smoke under the inner cover as it is lifted is also useful.

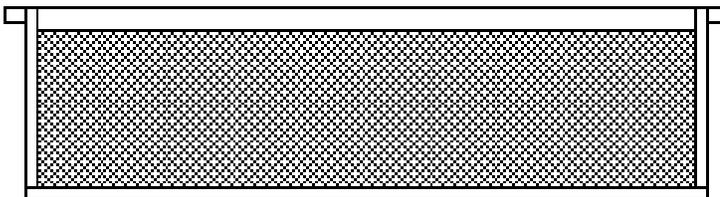
### The Hive Tool -



The standard hive tool is a flat piece of metal curved at one end. It is used as a scraper and a pry bar. Bees gather propolis from plants which they use to glue everything together in the hive. It then becomes a problem to separate frames and supers. To lift a super, the straight end of the tool is usually jammed into the corner of the supers and lifted for separation. The same technique is used to lift the inner cover from the hive. The hooked end is normally used to scrape excess propolis from the hive and frames. It can also be used to help start the first frame out of the hive.

### Removing and Replacing Frames, What to Look for -

Most beekeepers start examining a hive by removing one of the outermost frames while standing at the side of the hive. There are



it above them and naturally move the brood nest down as fall comes. This may not occur if fall honey flows are light. Should this happen, fall feeding may be advised to get the honey stores up.

## FEEDING BEES

Honey bee colonies may require feeding at any time of the year. Most often feeding is needed in the spring when winter honey stores are used up and no nectar flow is in progress. When the temperature rises to about 50 °F and it's sunny, a quick inspection of the colony can be made to check for honey and pollen stores. To make this kind of inspection, only a few frames just outside the cluster area need be removed. Honey bees require two kinds of food for proper nutrition, pollen and sugar. The pollen is their protein source and the sugar their carbohydrate source.

Honey would be an excellent food for bees, however, store bought honey may contain disease spores harmless to humans but deadly to honey bees. The same can be true of pollen bought in health food stores. A frame of honey from your own apiary, a known disease free colony, can be a good source of food for a colony short of stores.

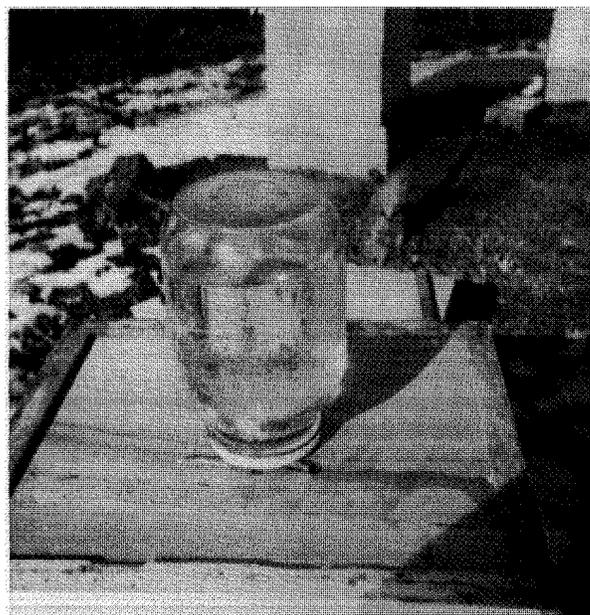
fewer bees there and the queen is least likely to be there and become injured while removing the frame. After starting the frame out with the hive tool, the frame is grasped by the uppermost corners. The first frame is removed from the hive, examined, and set down on edge leaning against the rear of the hive. Now the exposed face of the 2nd frame can be examined while removing it. Also the newly exposed 3rd. frame can be checked for the queen before turning the 2nd frame to examine the back side. After examining the 2nd, frame it can be reinstalled in the hive where the 1st. one came out leaving room to remove the 3rd. frame. The frames can be removed in sequence in this manner examining each on both sides. In general, it is not wise to change the relative position of frames in a hive so that the "bee space" is not disturbed. The exception to this rule is when the frame order needs to be changed for purposes of management.

As the frames are inspected, a judgement is made as to necessary management manipulations which may be required. As experience develops, beekeepers tend to be less thorough in their inspections. It is fairly well accepted that disturbing the colony less during inspections improves their productivity. It takes several hours for a colony to recover a thorough inspection and get back to normal behavior. Novice beekeepers need to be more thorough in their inspections to be sure not to miss early clues of a problem in a hive such as lack of brood production, diseases or parasites. It is generally recommended that a novice beekeeper start two hives. In this way one hive, lagging behind in development, commands attention so that potential problems are recognized early.

### New Colony Manipulations -

One of the first things which may happen to a colony is that it becomes honey bound. If this has occurred you will find that there are full frames of honey on the outside of the brood nest and almost every cell in the center is filled with brood, honey, or pollen. The solution is to move one or both of the honey frames out one space, and insert one or two new frames or frames of drawn comb, if available, on the outside of the brood frames. This allows a new space for the queen to lay eggs. Be careful not to expand the brood nest too fast for there must be enough bees to cover the frames to keep the brood warm if it should turn cold.

Generally, when 8 frames of the first brood chamber are filled, it is time to put on the 2nd brood chamber. To over winter well in Connecticut, the bees need to be in two full deep hive bodies. In the upper hive body as summer progresses you also may have to expand the brood nest. Your goal by the end of the first year is to have the upper hive body full of honey for the winter, and the small brood nest just below it. As the honey comes in, the bees will store



### Sugar syrup - Feeder jar turned upside-down over center hole in inner cover

The most common way to mix sugar syrup is 2:1 ratio. Commonly, this is accomplished by mixing 5 lbs. of sugar in a gallon jar of warm water. This same gallon jar can be used as a demand feeder by putting a dozen or more small holes (approximately 1/16 inch) in the cover and inverting it over the hole in the inner cover of the hive. The jar needs to be placed on twigs approximately 1/4 inch in diameter to allow room for the bees to move around

underneath it. The syrup will not run out, but will be held in the jar by the vacuum created in the top of the jar. The bees will be able to suck the syrup out through the holes as needed. To protect the feeder, an empty deep hive body can be put over it with the telescoping cover on top. If a gallon jar is not available, several quart jars can be placed around the inner cover hole as close as possible. Again, they need to be raised far enough for the bees to move about under the jar to obtain the syrup.

Many beekeeping supply companies sell a "Boardman Feeder" with their starter kit. This type of feeder has several disadvantages in Connecticut. (A.) The feeder is a long distance from the cluster. In cold weather, the bees will not be able to leave the cluster to get to the feeder. (B.) The feeder tends to stimulate robbing because access is easy from the outside of the colony. This is especially important if other colonies are close by. (C.) Typically, they contain only one quart of syrup, often only one day's supply.

### **Feeding Pollen Substitute -**

In the spring, honey bees may be short of pollen stores in the hive. When short, brood production is limited due to lack of protein availability. An established beekeeper can collect pollen from bees during the summer as a hedge against shortages in the following spring. Freezing is the best way of storing the pollen to prevent mold. Drying pollen for storage may be satisfactory, but at this time we do not yet know if there are nutritional aspects of the pollen which may be removed in the drying process. When natural pollen is unavailable there are substitutes. The basic formula consists of pollen substitute or pollen, if available, mixed with 2:1 sugar syrup. This can be rolled out into a patty between two sheets of wax paper.

The finished patty is placed on top of the frames in the hive above the brood nest. Keep the mix dry enough to keep the material from running down between the frames. Some recent preparations contain some vegetable oil (3 - 5%). The vegetable oil is intended to help keep the patty moist, but may also help control the population growth of tracheal mites.

Pollen patties which are made from substitute may be enhanced by the addition of natural pollen. To prevent the spread of disease, you could gather pollen from your own colonies for this purpose. 10% natural pollen in a patty has been shown to be as attractive to bees as natural pollen in most formulations.

Pollen substitute manufacturers often show pictures of honey bees working an open box or bag of their food. This is not an effective feeding method since foul weather and night time both interfere with the bees getting to the substitute.

## **PREDATORS**

### **Birds, plants and insect predators -**

It is agreed that the numbers of honey bees eaten by birds and

insects, such as praying mantises, is not significant. Also, sometimes plants snare bees unintentionally - most notorious for this is the milkweed plant. The flowers are very attractive to honey bees, but are constructed such that sometimes the bee's leg gets caught in the petal. Although a bee is occasionally lost to a milkweed plant, these losses are not significant to the colony.

### **Skunks -**

Skunks range throughout the state. They come out at night and scratch at the hive entrance to get the bees to come out so the skunk can catch them for a meal. Skunk predation is indicated when the grass in front of a hive is laid down flat radiating out from the hive entrance. Although skunk guards are available, a simpler, more expedient solution is to elevate the hive. This may have two advantages, it reduces skunk predation, and also reduces the strain on the beekeeper's back when inspecting the hive.

### **Black Bear -**

This is a new predator in Connecticut. The black bear has been absent from Connecticut until recently. In the early 1980's, sightings were made in the NW corner of the state. By the late 1980's, bee hive losses became significant. Losses approaching 25% of the hives in towns such as Goshen started occurring. Currently, the only available protection is an electric fence. Fortunately, the construction of such fences is facilitated by the recent introduction of solar fence chargers which don't need battery changes, run 24 hrs. a day, and can be put in remote locations.

Black bear predation generally occurs in the spring and fall when the bear is either hungry from winter hibernation or trying to fatten up for the coming winter. Once a bear starts to work hives in an outyard, it will not stop until all of the bees and honey are consumed. The only way to stop these animals is to move the remaining hives to a new location. If you are located in bear country, proximity to dwellings is no protection either. They have been known to enter houses in search of food, they fear nothing. Ask other beekeepers in your town whether protection from bears is desirable.

## **SUPERING**

### **Putting on Brood Chambers -**

Most beekeepers in Connecticut keep their hives in two deep hive bodies. There are two important reasons for this. One, the colony is maintained large enough to properly survive the winter months. Two, reversing the hives in the spring becomes easier. When a new colony has filled 7 to 8 frames in the first brood chamber, it is time to put on the second brood chamber.

### **Putting on Honey Supers -**

A honey super is a box of frames dedicated to the collection of

honey from a colony. Since a full deep hive body weighs approximately 90 lbs. when full of honey, most beekeepers choose shallow hive bodies for honey supers. A shallow super weighs about 35 lbs. This is an important consideration when a hive is producing a bumper crop and supers have to be taken from a hive which is head high. Also, when extracting shallow supers, two frames fit in the space where one deep frame would fit in most extractors. There are also medium deep supers available from most suppliers, although they are not a popular size.

### **Use of Queen Excluders -**

A queen excluder is an apparatus to prevent the queen from entering the honey super. Most current models are made of wire spaced so that the workers can pass through and not the queen. This prevents her from laying eggs in frames you will want to extract honey from later. Should the queen lay eggs in a honey super, the bees will also deposit pollen there. If you are able to eventually move the brood out of the supers, the remaining pollen from the brood rearing will make your extracted honey less clear.

There is much discussion among beekeepers as to the desirability of queen excluders. It is generally agreed that the bees do not like to go through it. Therefore, beekeepers who use excluders often let the bees start depositing honey in the super before installing the excluder. Those who do not use excluders sometimes have to deal with queens who lay eggs in every super from the bottom to the top. This leads to having to sort and select frames for extraction from several supers. Use of queen excluders remains a matter of personal preference.

## **WINTER MANAGEMENT**

### **Entrance Reducers -**

Most starter kits come with entrance reducers. The purpose is two fold. First, it reduces the air flow through the entrance of the hive. This helps maintain the interior temperatures of the hive in the winter. Second, the hole should be small enough to stop mice from entering the hive for the winter. They can do considerable damage to the comb on the lower part of the frames.

### **Top Ventilation -**

Some manufacturers of bee equipment provide a hole in the edge of the inner cover for top ventilation. You can provide one or simply lift the inner cover on sticks just enough so that the bees can crawl through. This provides an escape for the bees should the snow become deep, and also an escape for the moisture produced by the bees as they consume the honey. There are some beekeepers who prefer to put a hole in the front of their hive bodies for this purpose. Once again this is a matter of personal preference.

### **Winter Covers -**

By no means are winter covers universally used. Some of the more common covers are tar paper, various types of cardboard or plastic covers and plastic film placed around the hive, far enough away to create a greenhouse affect. Those that use covers claim that there is reduced honey consumption and faster buildup in the spring. Whether they are cost effective or not remains a topic of discussion. The object in all of the systems is to stabilize rapid temperature changes within the hive and keep the overall temperature average a few degrees higher, by insulating the hive and warming it up earlier in the spring.

**Tar Paper:** Since it is black, it absorbs the sun's radiation and warms the hive in the spring. Also, it has some insulation value and helps seal extra cracks in the hive.

**Cardboard Covers:** These have been produced in black, brown and clear plastic. All tout various advantages of reducing wind chill, insulation, and solar heating value. What remains true for all the systems is that they cost money and reduce honey consumption to some extent.

**Plastic Green House Type:** This is perhaps the most sophisticated system available. It consists of clear plastic, about four feet high, mounted around the hive at a space of about one foot from the hive. The plastic is left open at the top allowing the bees to leave the enclosure as soon as weather permits. The system not only reduces the wind chill factor in the winter, but also increases the solar increment of heat into the hive. This system is labor intensive, and costly. However, there can be a high return on investment in terms of honey production.

## **SPRING MANAGEMENT, SECOND YEAR**

### **Inspecting and cleaning -**

When the weather gets warm enough to thoroughly inspect a hive (60 °F and sunny), two things need to be done. Excess propolis needs to be removed from the end bars of the frames. Propolis is a resin collected from plants by the bees. It serves in the colony to help sterilize the inside and seal the hive from drafts. Although excess propolis removal can be done at any time, it is convenient in the spring when the bees may be totally out of one super. This will restore the original space which was between the frames and the end wall in the hive making removal and inspection of frames easier in the coming summer.

This is also the opportunity to pick up the bottom board, check for rot, and clean it. Scrape off all the dead bees, wax flakes and propolis accumulation. Level it up, if necessary for the next season.

### **Reversing Brood Chambers -**

As honey bees consume their stores through the winter, they move from the lower brood chamber to the upper one. As spring

pollen and nectar sources develop, the bees will store the excess honey and pollen above the brood nest. A situation can develop where nectar flows are strong enough that the bees begin to store honey around and below the brood nest while waiting for the brood to hatch from the pupal stage. The colony is now considered "honey bound". To prevent this from happening and help accelerate the colony's development, the brood chambers are reversed; the lower brood chamber is put on top. This allows the queen to move up into the empty brood chamber and load several frames with eggs, greatly accelerating the colony's development.

### **What to do with a weak colony -**

First determine the cause, and treat appropriately for disease or parasites. The colony can be united with another weak colony to make a stronger one or bees may be purchased to augment the colony strength. In both of these cases, the newspaper method of uniting the bees is the simplest. In this method, a single sheet of newspaper is placed between the colonies of bees. The newspaper is cut a few times near the center to give the bees an edge to grab and chew on to open a passage through. In this way the bees are slowly introduced to each other and very little fighting occurs. In a week's time a strong colony will remove almost all of the newspaper from the interior of the hive.

Another method of strengthening a weak colony involves switching hive stands with a strong colony. Bees carry a strong imprint of their hive location. The foraging bees, full of nectar, from the strong colony will return to the stand on which now stands the weak colony. The imprinting is so strong they will fail to find their own hive only a few feet away. These foragers will generally be accepted into the new colony without much difficulty since during their flight some of the pheromone which they carry from their queen has dissipated and they have a stomach full of fresh nectar to offer the new colony.

## **EXTRACTING**

### **Getting Bees Out of the Super -**

To remove the bees from a super, a bee escape is used. The most common type is the Porter Bee Escape. It is inexpensive and fits in the standard hole in the inner cover. The inner cover, with the bee escape fitted, is placed below the super about one full day before the super is to be removed. The bees can move down through the escape but are blocked from returning by a spring loaded gate. At best, this type of escape allows only two bees through at one time.

Another type of escape uses the bees instinct to take the most direct route to get somewhere. One is commonly known as the Canadian or ARTB type escape, and the other is known as the cone type of escape. These escapes work much faster since they are designed so that 20 or more bees can move through them at one time. They do cost substantially more than the Porter Bee Escape when purchased, but they also are not difficult to construct once

you see one. They are made of readily available materials, screening and wood, and can be made with simple hand carpentry tools. These escapes are used in the same way as the Porter Escapes, they are placed below the honey super.

### **Extracting and Filtering -**

A frame of honey is considered ready to extract when about 7/8ths of the cells of honey are capped. A honey extractor is a centrifuge type device. The wax caps on the cells of honey in the frame are cut off using a hot knife or are broken using a scratcher. The frames are then inserted into the extractor and spun to remove the honey. In Connecticut, there are bee equipment dealers who will extract your honey for a fee should you find the investment of an extractor too high. Also, groups of beekeepers often cooperatively purchase an extractor which they share.

The honey will come out of the extractor with a lot of wax particles and a few bee parts. All of this material needs to be filtered. Most beekeepers do this in stages, filtering the honey through finer and finer mesh screens. If the honey is extracted in a warm room and kept warm, the filtering proceeds at a faster rate. Once filtered, the honey can be put in jars for storage. No further preparation is needed, even for long term storage. Should a jar of honey granulate, it is not spoiled. Heat it up in a pot of warm water until it becomes liquid again, and it is ready for the table once more. Of course, some people prefer granulated honey. If this is your preference, simply store it in a cellar as close to 57 °F. as possible. This is the temperature at which honey granulates the fastest.

## **BIBLIOGRAPHY**

The Beekeeper's Handbook, Diana Sammataro & Alphonse Avitabile 1985, 148 pages ~ \$18.95. A common text used in beginning beekeeping courses across the nation. It presents many different management techniques from which to choose. This book was written by Connecticut people.

ABC & XYZ in Bee Culture, A.I. Root Co. 600+ pages ~ \$25.00 This is the oldest reference work in existence, originally published in 1877 and continuously updated.

The Illustrated Encyclopedia of Beekeeping, 1985 R. Morse & T. Hooper, 430 pages ~ \$45.00. This is a new reference work on the market.

The Connor Letter, Wicwas Press, This is a catalog of all available beekeeping literature and slide presentations. New audio-visual material is constantly being added to the available material. All of the above material is available from BES - Wicwas Press, P.O. Box 817, Cheshire, CT. 06410-0817.

## **PERIODICAL LIST**

American Bee Journal  
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