

# " Observant Beekeeping "™

by

Ian Fraser

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" The bees are the teachers , and , if we are observant , we are the students. "

Beekeeping can be a very simple and rewarding activity with minimal effort and large reward. On average , we spend about one hour per week tending to 20 beehives during the busy season , and only a few minutes per week in the off season. Observant Beekeeping is a very simple concept , as the term implies , we are observant when we are walking around the hive and working inside the hive. We use our senses to observe what the hive is telling us. As we first approach the hive, we watch for bee activity around the hive and on the front of the hive. As we get closer , we listen for the sounds of a hive and once we open the hive we smell the aroma of a hive. As we look through the hive , we are keenly observant of what is going on in the hive before we move or disturb anything. The sights , sounds , and smells of a hive are all indicators of the condition of a hive. We just have to learn to what they are and what they mean.

## Location of Beeyard

Before we can even think about setting up a beehive , the most important part of the process is deciding on a location for a beehive. It is said that honeybees will fly on average in a 2 mile radius of their hive - that works out to over 8,000 acres. We have to look at a map of the area that we have in mind to put a hive and draw a 2 mile circle around the hive . Within that circle we have to make sure there is enough forage plants that can sustain a beehive all season. Being close to a commercial agricultural operation might present a risk of pesticide and other chemical contamination. Then we have to find out if there are any other beehives within that 2 mile circle. Too many beehives too close together presents a risk of competition for resources and cross contamination of disease and pests , as well as a risk of robbing. Bees require water so a nearby water source is essential. A small patch of flowers in a backyard won't be enough to sustain a honeybee colony .

Honeybees will visit 2.6 million flowers to make 1 pound of honey . In preparation for Winter honeybees need to store about 100 pounds of honey. That would require them to visit about 260 million flowers just to prepare for Winter, not taking in to account the food required through the season to sustain the colony.

( [http://www.honeycouncil.ca/chc\\_poundofhoney.php](http://www.honeycouncil.ca/chc_poundofhoney.php) )

Now that we have a location in mind we have to look at year round accessibility. Depending on the region , we might have to look at seasonal conditions that might make it difficult to get to the beeyard. Moisture build up in a hive is probably the biggest threat to a healthy hive , so we have to avoid damp , low lying areas. Beehives should be set up off the ground so as to allow good air flow around the hive. Beehives should be sheltered from prevailing winds. If the beehive is to be located in an urban setting , local by-laws need to be adhered to , and it is always a good idea to enlist the support of the neighbours .

## Installing a Nuc

When installing a nuc , first prepare the hive that the nuc is going into - set up a bottom board and only one empty brood box . Open up the nuc box and transfer the frames of brood , in the same order as they came in the nuc box into the middle of the brood box and fill in the rest of the box with frames with drawn comb if possible. Be careful not to squish the queen during the transfer. Place the inner cover on the single brood box with the upper entrance open and down , and then put the telescoping cover over the inner cover and pull it forward so that the bees have access to the upper entrance. Feed the nuc for the first couple of weeks with 1:1 syrup , to provide the bees some resources with which to build comb and get established. A queen will be stimulated to lay eggs if there is food coming in to the hive. I prefer a hive top feeder - it is easy to fill and monitor without disturbing the bees and cannot be robbed by wasps or other bees. Once the nuc is installed in

your beehive , reduce the entrance so the bees can protect their home. Check back in 3 days to make sure the queen is alive and laying eggs , and that there are larvae and capped brood present in the hive.

## Inspecting a Beehive

I recommend visiting your beehive on a regular basis , at the same time and on the same day of the week . Since I am busy 6 days a week , I visit my beeyard on Sunday morning. It is easier for me to maintain a routine if I set aside the same day each week. A week is also a good frequency to check on the beehive. A lot can happen in a short time , and by setting aside the same time each week , I don't lose track of when I was last at the beeyard .

It is recommended to keep a journal , and identify each hive and each part of the hive. This is especially important if you have more than one hive and end up with any disease in your beeyard. A journal is an important tool in the tracking of the growth of a beehive , monitoring pests and disease, treatment and feeding schedule , honey harvest and the overall health of the hive. It is also a good idea to keep track of the weather and floral sources available at different times of the year. Over the years this information will be useful in determining cycles and patterns.

As we approach the beeyard we look around at the overall activity in and around the beeyard. I always like to stop and watch the bees flying in and out of the beeyard , making note of the direction of the flights and how many bees are flying. As we get closer , I like to focus my attention at the front of the hives and monitor the activity on the front porch and the upper entrance. The time of day and weather conditions are big factors in the activity around a hive.

As we get closer , I like to stop at each hive and watch the bees coming and going at the main entrance. I am always interested in the pollen that the bees bring in, this is a good indicator of what flowers the bees are visiting as they gather nectar. While I stand to the side of the hive , and watch the bees on the porch , I am also listening to the sound of the hive. A happy hive has a nice even hum to it , as the bees go about their business. It is always a good idea to work from the side and rear of a beehive. The bees really don't like us standing in the front , interfering with their access to the entrances. Whenever I go out to the beeyard I always bring along a pail to collect burr comb , propolis and hive scrapings.

Over the past few years I use less smoke than I did when I first started beekeeping. It is a personal decision as to smoke or not. On a warm sunny Summer afternoon just after lunch , most foragers will be out gathering nectar and pollen , and the bees remaining in the hive will be busy tending to the brood . This would be a good time to go into a hive without the need to use smoke . The more gentle and quiet we are opening up a hive , the calmer the bees will be.

The first thing to do would be to blow a little puff of smoke into the main entrance and then a little puff of smoke into the upper entrance. We then remove the outer cover and set it upside down on the ground beside the hive , as we do so we watch to see the bees reaction. At this point we observe the feeder hole and upper entrance . We then take our hive tool and pry up each corner of the inner cover , starting from the rear of the hive. Once loose , we lift up one side of the inner cover a few inches and blow a little puff of smoke into the gap between the inner cover and the bee hive. We slowly lift off the inner cover and blow a few puffs of smoke across the top of the frames that are now exposed. We then place the inner cover upside down on the ground in front of the hive. Once the smoke has dissipated we should smell the sweet smell of a healthy beehive - a warm sweet yeasty aroma. AAHH !!

Bees like to build burr comb between the inner cover and top of frames , and if the frames are brood frames they will fill this burr comb with drone larvae. When we lift off the inner cover we quite often break open these cells and expose drone larvae. This is an opportunity for us to inspect the drone larvae for mites ( Mites like to lay eggs in drone cells ) . We then scrape off the burr comb from the underside of the inner cover and the tops of the frames , and place it in a pail. When inspecting a brood box we always start by wedging

our hive tool between the first and second frames where they meet at the end bar spacer. We then pry the first frame into the space between the frame and the box, and then lift up on the ears of the frame with our hive tool to loosen the frame. We then use our fingers to pull the frame out of the box being careful to feel for any resistance as we remove the frame. We hold onto the frame by the ears of the frame and inspect each side of the frame. We then set aside the frame on frame holders or the top of the hive beside us. We then wedge our hive tool between the second and third frames and pry apart the second frame and lift up the ears with the hive tool and then lift out the frame, inspect the frame and set it aside. Once we have removed and inspected 3 frames we have enough space to inspect the remaining frames in the box. We move the frames into the empty space in the brood box and after inspecting the frames we set them back into the box over to one side.

**NOTE:** Never pull a frame out of the middle of a brood box, when the brood box is full, for risk of rolling the queen. Always work from the side and use the extra space between the first frame and box to get started.

Once we have inspected all the frames we put them back in the box in the same order that we found them. We don't inspect all the frames in every box every time we visit the hive. We usually have a pretty good idea of the health of the hive after looking at 3 or 4 frames. We try to disturb the hive as little as possible, and only perform a complete inspection if necessary. It is said that the bees will require about 24 hours to get back to normal after an inspection.

During an inspection of a brood frame we are looking for all the stages of development of the larvae and if we see eggs we know the queen is active. Each brood frame should have some capped honey and bee pollen around the outer edges of the frame with lots of capped brood in a rainbow pattern in the middle of the frame.

A deep frame has about 3,000 cells on each side, totaling about 6,000 cells per frame. A queen might lay 1,500 eggs per day during peak season midsummer. On average a good laying queen will fill a brood frame in 4 days. Based on this estimate a queen really only requires 6 frames for her brood nest. We provide her with ample space in a 10 frame brood box. Often the outer frames of a brood box become filled with honey, which I like to remove when I notice that they are full. Then what I will do is open up the brood nest and put empty frames of drawn comb in positions 3 or 7 to give her some room to work. I don't like disturbing the core of the brood nest, but I will shuffle the outer edges of the brood nest when appropriate. If we are inspecting a hive with two brood boxes, we put the top brood box onto the outer cover, 45 degrees out of sync with the outer cover. In that way the brood box is sitting on the edges of the outer cover which make it easier to pick up later, but still protected, in case the queen might fall through she will land on the plywood lid and not get lost in the grass. The burr comb between the two brood boxes will be full of drone larvae, which gives us another opportunity to check for mites. We scrape off the burr comb and place in the pail. Once finished, we place the inner cover on the beehive with the upper entrance open and down, and then we put the telescoping cover over the inner cover and pull it forward so that the bees have access to the upper entrance. The upper entrance also vents warm, moist air.

**NOTE:** The bees build ladders on the bottom of the frames in the lower brood box so they can climb up onto the frames when they return to the hive - I don't remove the ladders.

## Spring Hive Inspection

As Spring approaches the queen begins to lay eggs and the Winter cluster starts to die off as the new bees emerge. There tends to be a lot of dead bees on the bottom board which can block off the lower entrance. During our Spring hive inspection we need to clean out the dead bees and make sure that both entrances are open. I like to scrape off the burr comb and generally clean up the hive. This time of year the hive is experiencing a lot of activity and regeneration and starting off with a clean environment is always beneficial.

During the Winter months the bees start at the bottom of the hive and work their way to the top. In the Spring the queen starts to lay her brood nest in the upper box of a two super brood chamber. During the Spring inspection we reverse the boxes so the queen ends up in the lower brood box. The queen generally moves

upwards as she lays eggs , so by reversing the brood boxes this provides her with ample room.

## Looking for the Queen

I don't spend much time looking for a queen in a beehive . The queen doesn't want to be found , she doesn't like to be disturbed , so I don't bother her. It is always exciting to see the queen on a frame , even after all these years playing with bees . The queen is so vitally important to the colony that when we see her , we are in awe of her beauty . But she is fragile and can easily be damaged. Any slight deformity that impedes her in laying eggs , will be noticed by her attendants , and they will replace her. I know many a newbie , in their quest to find the queen , have either damaged or killed the queen . Instead , I look for the evidence that there is a healthy queen present in the beehive . It is much quicker and less intrusive to locate freshly laid eggs , larvae in different stages of development and capped brood on a frame in the brood box.

A queen right hive will be calm , quiet and easy to work. A queenless hive is full of foragers and is loud and the bees are aggressive. They are trying to attract a queen by fanning their wings , sometimes referred to as the " roar of a queenless hive ". Be careful around a queenless hive - keep your smoker handy !

## Stages of Development

When the queen lays an egg , it looks like a very small grain of rice in the center of the cell. After 3 days the egg will hatch into a larvae at which time the nurse bees will begin to feed the larvae. All larvae are fed royal jelly on days 4 and 5 , however , the feeding and development time is determined by the type of bee from then on. Queen larvae are fed royal jelly exclusively , while workers and drones are fed bee bread.

Worker brood caps are flat and level with the top of the cells , drone brood caps are raised and dome shaped.

Worker - The larvae will fully develop at day 9 at which time the nurse bees will cap the cell. The larvae will then pupate and will emerge as a young worker on day 21

Drone - The larvae will fully develop at day 10 at which time the nurse bees will cap the cell. The larvae will then pupate and will emerge as a young drone on day 24

Queen - The larvae will fully develop at day 8 at which time the nurse bees will cap the cell. The larvae will then pupate and will emerge as a young queen on day 16

## Swarms

There are two basic types of swarms - an overcrowded swarm and a reproductive swarm.

Bearding on the front of the hive might be an indication that the hive is overcrowded and might be preparing to swarm. Keep in mind that a decision to swarm has been made about 2 weeks before a beehive is ready to swarm. That is why it is important to check your hives every week.

Two queens cannot live in a beehive at the same time , so just before the virgin queen is ready to emerge , the old queen stops laying eggs and reduces her body mass in preparation of her flight. When a swarm leaves a beehive , over half the bees leave with the old queen and they take along about half the honey reserves in the hive. Soon thereafter the virgin queen will emerge from her cell , and if the conditions are favourable over the next week or so , she will leave the hive to mate. If all goes well , the queen will start laying eggs 7 - 10 days after the swarm left the hive. This provides a brood break that is beneficial in the reduction of mites , if there are mites present in the hive.

One method to prevent an overcrowded swarm is to provide them with enough room to grow so they don't become overcrowded. We use the 70% rule when deciding when to add another box. When 7 frames are full of brood , we add second brood box. When the second brood box is 70% full of brood , we put on a queen excluder and a honey super , and so on . If we notice that queen cells are being produced it becomes obvious that they

want to swarm , at that point we just split the hive. If we scrape off queen cells they just keep making more.

An overwintered colony has been preparing to reproduce since the end of the previous summer . To prevent a reproductive swarm it is best to split the hive. The bees want to swarm , which is essentially the hive splitting on its own , so by being proactive , we can manage the situation and not lose the swarm. If there is a frame with swarm cells on the bottom, we would move that frame into a new hive set up , along with some frames of brood and honey. To distract the main hive from the swarm response we checkerboard the brood nest with empty frames to pre-occupy them with building new comb. At this point we would put a feeder on both hives to encourage them to build up quickly. Adding extra boxes will not prevent a reproductive swarm.

Note: If the queen becomes " honey bound " she will want to swarm. This is why it is so important to check the brood boxes every 7 days and remove full frames of honey in positions 1 , 2 and 9 , 10 and replace them with empty frames.

It is very important to be sure that there are drones present in the hive before making a split.

Honeybee colonies are resource driven , the queen's egg production increases when there is an abundance of food coming in to a hive , and decreases during a drought.

An easy way to check for swarm cells is to tip up the brood box and look at the bottom of the frames.

## Queen Cells

A queen cell located on the bottom of a frame indicates the hive is preparing to swarm . A queen cell located 2/3 of the way up on the frame indicates the hive is replacing the existing queen .

## Making a Split

Making a split can be as easy as dividing the hive into two parts with equal frames of brood with eggs , larvae in all stages of development and capped brood , and putting them in two brood boxes. If we start off with a double brood box hive , we make two single brood box hives with each of the brood boxes. If we are going to leave the hives in the same beeyard , it is important to remove the hive from the old location. The foragers will return to the spot where the old hive was located. So we set up the two hives beside each other , with the space between the two hives in the middle of the spot where the old hive was located. We turn the entrances slightly towards each other so when the workers return , they will be confused and pick one hive or the other. A few days later it would be a good idea to switch places of the hives , which will help even out the work force. We do this during the middle of the day when the foragers are out of the hive. One hive will retain the original queen and one hive will raise their own queen. If we don't want to wait 3-4 weeks for the queenless hive to re-queen on their own , we will introduce a mated queen into the queenless hive after 24 hrs.

## Introducing a Queen

Queens arrive in a shipping cage with several attendants . At one end there is a candy plug that provides food for the queen and her attendants during transport. Introducing a queen into a hive has a higher success rate if the hive has been queenless for 24 hours. Over that time , the old queen's pheromones have dissipated and the bees in the hive will accept the new queen more readily. Before we install the queen cage in the hive , we first remove the small cork that covers the candy , then we use a small nail or wire to poke a hole in the candy plug. This helps the bees get the idea to chew through the candy to let the queen out. To install the queen cage , we open up the hive and spread two frames of brood far enough apart so that we can place the queen cage between two frames. We place the queen cage with the candy plug upwards , and place it between the two frames and gently squeeze the frames together. The drawn comb on each frame will hold the queen cage in place. We'll then close up the hive and leave it for a couple of days to allow the bees to chew through the candy and release the queen into the hive. This slow release technique allows the bees to get used to the new queen before they have

access to her , which minimizes the risk of the bees that might be loyal to the old queen from killing the new queen. If a hive has been queenless for an extended period , and there is no capped brood or nurse bees , it is recommended to add a frame of brood with nurse bees from another hive , when introducing a mated queen.

## Laying Worker

If a hive is queenless for a long time , the remaining bees may panic and a few workers might begin laying eggs. Since the laying workers have not been mated , they are only able to lay drones. An indication that the hive has a laying worker is multiple eggs in the cells and oodles of drone brood. When this situation occurs the hive is doomed. One possible course of action might be to shake all the bees on the ground 100 ft. away , with the hope that the laying worker will perish in the grass while the other bees will fly back to the hive. If the plan is to re-queen the hive, it would be a good idea to wait a couple of days to be sure there is no laying worker in the hive before trying to re-queen the hive. A laying worker will kill any mated queen that is introduced and with a laying worker in the hive the bees won't make a queen cell from any eggs or larvae that might be introduced.

## Pulling a Nuc

To pull a nuc from a hive , we first select a strong donor hive . We prepare an empty brood box and collect 4 frames of drawn comb and sit them beside the donor hive. We then select 2 frames of brood and 1 frame of honey/pollen from the donor hive and brush off the bees. We then put the 2 frames of brood and the frame of food in the middle of the empty brood box and then replace the 3 frames that we have removed from the donor hive with empty frames of drawn comb . We then put a queen excluder on the donor hive and place the box with the frames of brood/food on the hive . We then close up the hive and leave it for couple of hours. When we return to the hive , some nurse bees from the donor hive will have moved up through the queen excluder to tend to the brood. We then move the 2 frames of brood and one frame of honey from the donor hive covered in forager bees and an empty frame into an awaiting nuc box and close up the lid. We will introduce a mated queen into the nuc after 24 hrs.

## Integrated Pest Management ( IPM )

A fancy term for non chemical methods to control pests in a beehive , which may include - screened bottom boards , drone frames , sugar dusting , mineral oil fogging and natural re-queening of a hive to provide a brood break.

Screened bottom boards - provide extra ventilation in the warm summer months.  
- mites fall through the screen and can't get back up into the hive.

Drone frames - trapping mites with drone frames is an effective technique to reduce mites in a beehive . The female mite is attracted to the drone larvae which has a longer cycle. The female mite crawls in with the drone larvae just before the cell is capped. Once most of the cells are capped on a drone frame we remove the drone frame from the hive and place it in a freezer for 24 - 48 hours. We then place it back in the hive and allow the bees to clean it out and refill it. We continue this process all through the summer. A drone frame can be an empty wooden frame placed in position 3 or 7 in which the bees will build natural comb of drone cells , or a commercially prepared large cell drone frame.

Sugar dusting - sprinkling icing sugar onto the bees in a hive encourages bees to groom each other , and in the process knocks off any mites.

Mineral oil fogging - the mineral oil mist coats the mites causing them to suffocate.

Natural brood break - when we re-queen a hive by letting the bees produce a queen cell and allow it mature and the virgin to mate , we produce the conditions where there isn't any brood in a hive for a period of time. Without any brood in the hive the mite has no food supply. 16 days to raise a queen , 7 days to mate and 4-7 days to begin laying eggs = 30 days . The life cycle of a varroa mite is 27 days. Without larvae the mites aren't able to reproduce before they expire at 27 days.

## Drone Fertility

Drones become sexually mature 42 days after bee pollen first starts being brought into the hive. The first pollen triggers drone production in the hive . Drones become sexually mature when they are at least 14 days old and have had 4 good flying days . A drone emerges from its cell 24 days after the egg is laid , we add 14 days and 4 flying days which all adds up to 42 days.

There have been many studies done around the world that have determined that the use of organic and synthetic chemical treatments for mites negatively impact drone fertility and viability . Be aware that if you plan to re-queen a hive by allowing a queen cell to develop and mature , the drones that will available to mate with the virgin queen should not be exposed to miticides.

## Queen Excluders

Queen excluders are metal or plastic grates used to isolate the queen. Not everyone likes to use queen excluders , while others do. Queen excluders can be a useful tool in managing a hive , we use queen excluders when pulling nucs and converting deep brood boxes to medium brood boxes. However , if a hive is not managed properly a queen excluder can become a hindrance.

A properly managed beehive does not require a queen excluder. The reason a queen moves up in the hive is because she becomes crowded. She is looking for a place to lay her eggs , she will go up or down searching for open cells. If we manage the brood box , by removing frames of honey and replacing them with empty frames, the queen will always have room to lay her eggs. It was discussed earlier that the queen only needs 6 deep frames to lay her brood nest. During our weekly inspection , if we notice that the outer frames in the brood box are full of honey , we should remove them from the brood box and put them up above in the hive or extract them. We then move over the next frames towards the outer edge of the box and put empty frames on the edge of the brood nest. For example , if frames 1 , 2 are full of honey, we would remove them and slide frame 3 into position 1 , then put empty frames into position 2 , 3. On the other side of the brood box we would remove full frames of honey in position 9 , 10 and slide frame 8 into position 10 and put empty frames in position 8 , 9 .

If a queen becomes honey bound she wants to move into a space where she can lay her eggs. If she is restricted by the use of a queen excluder and can't find any empty cells she will want to swarm.

Some beekeepers feel that a queen excluder restricts movement of air and bees within a hive.

If a beehive has an upper and lower entrance , the bees will have access to all parts of the hive, even if the bees are too big to fit through a queen excluder, they can use the entrances.

Bees build burr comb in the space between the top of the frames of a lower super and the bottom of the frames in an upper super. The bees will build the burr comb between the frames whether there is a queen excluder or not. The bees will always leave the " bee " space between the frames open to allow movement of bees and air. If we use queen excluders, we see evidence of this on the queen excluder when we remove it. There are rows of beeswax clogging up the queen excluder only where the frames were , the spaces in between the frames is always clear. What is most important when we put the frames in the supers , is that they align with the frames in the supers above and below. In doing this, we maintain these corridors between the frames , in between

supers. When we are finished our inspection , we check this alignment by looking into the hive from the top and making sure we can see through the spaces between the frames all the way to the bottom of the hive. The easiest way to maintain this alignment is to always use the same size of frames in your hives , keep the spacer bars clean of propolis and squeeze them into the middle of the boxes after each inspection.

## Converting Deep Brood Boxes To Medium Boxes

We use queen excluders when we are converting deep brood boxes to medium brood boxes. We first put a medium super on the deep brood boxes without a queen excluder and allow the queen to become honey bound so she'll move up. Once she moves up into the medium super we then put a queen excluder between the deep supers and medium super and allow the brood in the lower brood boxes to emerge. We add medium supers on top of the hive as needed , following the 70% rule. We remove the lower brood boxes once they are empty of brood , and remove the queen excluder.

## Harvesting Honey

Harvesting of honey can be done using various techniques at different times of the season. How and when a beekeeper harvests the honey depends on the desired end result. Normally , I prefer to keep adding honey supers through the summer and harvest the honey once at the end of the season . That way there is only one sticky mess to clean up. I blend all the honey together and sell it as wildflower honey.

Some beekeepers like to harvest honey after each nectar flow and keep it separate and market it as varietal honey. This technique is difficult to do correctly and exclusively. We have no control over where the bees travel and what flowers they visit. Even in a blueberry patch or a fireweed patch , there is always other flowers around the edges or nearby that the bees will visit. It is impossible to guarantee 100% pure honey of one specific nectar source.

At the end of the season , usually late August , I prepare to pull off the honey. There are several techniques that can be used. If I have only a few hives to extract I'll use the bump and run technique. This involves taking out a frame of honey and bumping it on the box to remove the bees and running to the car where I have a plastic tote with a lid waiting. Another technique I use if I have several hives to pull honey from , I will use " Bee Escape Boards " also known as " Clearer Boards ". These boards are basically an inner cover with a series of mazes on one side that act as a one way valve. We place the board between the brood boxes and honey supers. I like to close off the upper entrance , which forces the bees to use the lower entrance. Over the next 24 hours the bees will travel down through the bee escape to the lower parts of the hive and not be able to return through the maze back to the honey supers. I will return the next day to remove the empty honey supers.

Another simple and effective technique involves putting the honey super on it's end on top of the hive about 4 hours before dark. The bees will crawl into the hive overnight and then the honey super is removed first thing in the morning before the bees go out to work. Some commercial beekeepers use a gas powered leaf blower , the honey supers are set on their ends on the ground and the bees are then blown out.

Once you have your honey supers cleared of bees it is time to extract the honey. A simple and effective way to extract the honey is to use a honey extractor. Hand crank or electric models are available depending on your requirements. Honey should be as warm as the hive it came from to extract. The average temperature in a beehive is about 93 F. The warmer the honey the thinner the honey , which makes it easier to extract.

To begin the extraction process we first need to open up the cells of honeycomb. To do this we can cut off the caps , scratch open the caps or melt open the caps. Once the cells have been opened we then put the frames into the extractor and spin out the honey. It doesn't take long to extract a frame of honey if the conditions are suitable. It is always a good idea to open the honey gate of the extractor so the honey will drain out while extracting and not back up and restrict the motion of the basket inside the extractor.

It is important to make sure the honey is " ripe " before extracting. All capped honey will be ripe but there

may be uncapped cells on a frame. As long as there isn't more than 10% uncapped cells we should be alright. We can test the moisture content of our honey with a refractometer if we have any concerns .

## Over Wintering A Beehive

After the honey is harvested we begin the preparation to over-winter our beehives. First we reduce the beehive to two brood boxes , and then we install our hive top feeders. The hive top feeder is closed in with a box made with 1 x 4 lumber. The inner cover is installed with the upper entrance down so the moist air will vent out. The mouse guard is in place and the screen bottom board is closed up. Any wind blowing against the front of the hive will produce equal pressure on the two entrances so no draft is created. We will over-winter with two brood boxes so they will have enough stores to hold them until Spring. We will feed with 2:1 sugar syrup . Once the weather cools off we will switch over to dry sugar in the feeder. Any moist air that rises up through the feeder hole into the feeder will condense on the feeder lid and drip onto the dry sugar so the bees can work it to feed. In the Lower Rainland , the bees will also have enough moisture from outside the hive during the rainy season to work the dry sugar. We will install a piece of Styrofoam insulation under the outer cover to keep the hive top feeder warm , and a piece of insulation between the slider and the bottom screen to keep out any cold drafts. In the Lower Rainland , we won't need to wrap the hives. The bees will seal up the gaps with propolis and by using a hive top feeder we won't need to break those seals during the colder months to monitor feed levels. Ideally we will go into Winter with 80 - 100 lbs of honey per hive , the feeders are installed as an insurance against starvation not to replace their natural food.

In colder climates , it would be a good idea to insulate the hives for Winter . What is important to keep in mind is to provide an air channel on the outside of the hive between the lower and upper entrances in Winter, and to keep the upper entrance open and facing down. This will vent out any moisture in the hive and provide access in case the lower entrance becomes blocked with dead bees. It is always a good idea to put an oversized piece of plywood over the hive to keep the weather off the hive. The insulation keeps heat in the hive , and moderates temperature fluctuations in the hive. The bees aren't trying to keep the whole hive warm , but , they do benefit from any residual heat that is contained within the hive.

Bees are cold blooded and the warmer they are the more active they are , which results in a higher consumption rate of food. If a beehive is wrapped for Winter it is important that there is enough stores in the brood boxes to hold them until the first flowers of Spring. Otherwise , supplemental feeding is recommended. The hive top feeder can be checked and filled without disturbing the colony , even at - 30 C . With a hive wrapped with insulation , and a piece of styrofoam between the feeder and the outer cover , the sugar syrup within the hive top feeder will not freeze or go mouldy.

Something we have to keep in mind is that hot air rises , and if that air has moisture in it , it should be vented directly outside. If you have ever heated your home or cottage with a wood stove , you know that the creosote builds up whenever there is a bend in the chimney. The same thing will occur in a beehive with the moisture , if there is a redirection in the air flow , the air slows down and allows the moisture to build up. Also , moist air will condense if it hits a cold surface , such as a cold outer cover. It is important to insulate the space under the outer cover and to vent the moist air directly outside. We leave our upper entrance open and exposed , but covered with an extra overhang to keep the weather off the front. Wind blowing on a hive with upper and lower entrances on the same side will have equal pressure on the entrances so there won't be a draft. We put our mouse guard/entrance reducers on the lower entrance. The bees will propolize the upper entrance to regulate the air flow.

Bees are no so different from many species - if provided with a warm and dry shelter , and enough ventilation and food. They will over winter very well.

# THE BEEKEEPER'S YEAR

The weather, climate and location are factors that influence the activities in a hive which dictate the activities of the beekeeper. This summary will provide a hobby beekeeper with guidelines of what to expect each month in most parts of Southern Canada . The bees start preparing for next season in August so that is where we will begin.

## August

As the good weather continues, the hive should be busy gathering nectar and pollen. By the end of the month the hive will begin to slow down as the days shorten and the temperatures cool. This time of year we have to keep an eye on robbing by wasps and other bees , and reduce the main entrance if necessary.

## September

As the temperatures cool and the days shorten, there is a noticeable reduction of activity around the hive. The queen dramatically reduces her egg production, and we begin to see the drones being removed. This is the time for harvesting the excess honey from the hive , leaving the colony with enough resources to over-winter.

## October

Activity within the hive is greatly reduced. The bees are preparing for Winter. We begin feeding the bees with syrup with BEE TEA using an entrance feeder. Near the end of the month we configure the hive for winter, with attention to ventilation and moisture control. We remove the entrance feeder and install a mouse guard on the main entrance. We install a hive top feeder and fill with 1:1 syrup. Be careful not to over feed in the Fall, the queen needs room to lay her Winter Cluster.

## November

We wrap our hives and monitor feed levels. At the end of the month we switch the feeder from 1:1 syrup to dry sugar.

## December

The bees are in a tight cluster and we won't need to check the feeder for awhile.

## January

The queen is in the middle of her winter cluster. The workers might take a cleansing flight on a warm day. We are able check our hive top feeders without disturbing the hive.

## February

The queen will begin to lay a few eggs , the workers will take cleansing flights on mild days. Make sure the entrances to the hive are clear to allow for proper ventilation. The bees start to take the feed so monitor feed levels in the hive top feeder.

## March

The hive becomes more active as the days grow longer and the temperature warms. The queen is increasing her egg production , there is more brood in the hive and more food is being consumed. Keep the main entrance open and monitor feed levels and add feed to prevent starvation , with warmer temps we switch over to 1:1 syrup.

## April

The weather warms up and the trees start to blossom. The bees start to bring pollen into the hive. The queen increases her egg production, and the population builds. The drones begin to appear. We switch over to 2:1 syrup in the hive top feeder. Near the end of the month on a warm and windless day we will remove our hive wraps and perform our first hive inspection. We will look for eggs , larvae and brood in all stages of development. We will reverse our brood boxes, which will allow for a better distribution of brood. We clean up the burr comb and remove dead bees from the bottom board. We will remove the hive top feeder. We will stimulate the growth of the colony by feeding the hive syrup mixed with BEE TEA using an entrance feeder.

## May

The hive is very active with the warm weather and the first flowers of Spring. There is lots of pollen and nectar being brought into the hive . The queen is in full egg production as the colony builds up. The hive is gearing up for its reproductive swarm so we begin our weekly schedule of hive inspections. We check for the production of queen cells and make our split once the queen cells are capped. Near the end of the month we remove the feeder and add a honey super if conditions are favourable.

## June - July

Summer is in full swing , hives will be strong with the warm weather and lots of resources. During our weekly inspections we will be checking for eggs/larvae/brood and swarm cells , and adding honey supers as the lower boxes become 70% full. If we notice problems with the queen we will re-queen a hive with a mated queen or transplant frames of brood from another hive.