

Top Bar Beekeeping in New Zealand Backyards.



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Introduction

This e-book is an introduction for anyone considering keeping bees in their backyard, particularly in a Top Bar hive. The scope of the information within this book does not cover the vast amount of information and skill necessary to keep bees successfully. It is hoped and recommended that you do further reading. However it serves to give you a good starting point and reference.

Top Bar beekeeping is a relatively new way of keeping bees in New Zealand but it is not difficult, expensive or time-consuming. Please don't be put off by negative comments from bee keepers who keep bees in a different system. Bees require less time than a dog but perhaps slightly more care than a cat. In late Spring through to Autumn expect to visit your bees every 15-20 days to add new top bars and to harvest honey. With practice most Summer hive visits take only 10-20 minutes. Winter is a quiet time with only the occasional peak through the observation window necessary.

This book has been written by a Kiwi Top Bar beekeeper so describes New Zealand legislation, regulations and present bee diseases found in New Zealand. For honey bees to be healthy and flourish they require care and maintenance from a committed beekeeper. Please don't place a hive in your garden and expect the bees to do the rest with no care from you. Your colony will succumb to varroa and maybe other diseases, within a year, whilst possibly spreading disease to other local hives.

Please visit our Save the Bees Backyard Bee Forum to ask any questions, gain advice and knowledge share on Top Bar Beekeeping in New Zealand. <http://www.greenurbanliving.co.nz/forum/>.

Subscribe to the e newsletter from Green Urban Living for monthly advice for Top Bar bees. <http://www.greenurbanliving.co.nz/signup.php>.

Thinking of Keeping Bees?

What initially struck me was the cost and the amount of gear required to run a conventional hive. To buy a new hive and all the required tools can easily set you back \$800. The other surprise is the bulky equipment required and the amount of space required to store this.

Searching for a cheaper and easier alternative led me to the Top Bar Beehive. This is one of the oldest and simplest ways of keeping bees and requires little skill. Sounds perfect for me! These hives have been around since the 1600's and are popular in African countries as there are few tools required and the hive is easy to build, practical and productive.

Basically a Top Bar Bee Hive is a wooden rectangular box with wooden bars across the top which the bees build honey comb down from. It is a more natural and sustainable way of keeping bees as the bees are allowed to build honey comb to their natural dimensions with no interference from us. The honey is harvested as honey comb, one bar at a time. Honey volume is not quite as high as in a conventional hive but you do get more wax. This can be used to make candles, furniture and leather polish.

This type of hive is perfectly suited to the home bee keeper as it is a simple design, management of the bees is very 'leave alone' and there is evidence that this type of hive reduces the incidence of Varroa mite infection. It particularly suits people with disabilities, bad backs and women, as there is no heavy lifting of super boxes, which can weight up to 50kg when full of honey.

<i>Pros of Top Bar Hives</i>	<i>Cons of Top Bar Hives</i>
Can build hive yourself	Lower honey production
Inexpensive to buy	Delicate combs- can break off if bumped
No heavy lifting required	Hard to move hive as does not stake like a conventional hive.
No need for honey extractors	Lack of advice/experience as relatively new method in NZ
No need for frames or foundation	
No storage required for extra hive boxes and other equipment	
Ease of inspection of combs avoids disturbance of bees	
Naturally warmer with better insulation in the winter.	
Viewing window great way to get kids involved	
More beeswax created	

When talking to professional bee keepers about Top Bar hive's don't be put off if they look at you blankly. Most bee keepers have not heard of this way of keeping bees and indeed Top Bar hives are not

an option for a professional bee keeper as the honey production is not as high as with a conventional hive. These hives are becoming more and more popular in the UK and America, where people are looking for a more natural and cheaper way of keeping bees. A great website to start your research is Phillip Chandlers Biobees (www.biobees.com). You can also buy his book *The Barefoot Beekeeper* which describes the management and care of a Top Bar hive based on his U.K. Experience.

Download Phil Chandlers step by step guide to building a Top Bar Hive from the Save Our Bees website.

Top Bar Hive Design Recommendations for New Zealand

Floor of Top Bar Hive	I recommend a mesh floor with a hinged floor board. Keep floor open in summer and closed in winter. The mesh helps get rid of any varroa mites falling off adult bees. The wooden floor helps you monitor dead varroa after a treatment. Use garden mesh or you can get stainless steel woven mesh from an Auckland company called Locker Group 09 273 9820 or www.lockernz.co.nz . They normally sell large rolls but may have some off cuts.
Viewing window	A great addition to the hive as you can easily check you bees without opening the hive. Children love looking through the window. Make it a long rectangle shape. Make sure it is flush with the inside of the hive or the bees will build bridging comb up against the window blocking it.
Roof	With New Zealand's wet weather I recommend a pitched roof so any rain is shed quickly.
legs	Sit the legs of the hive on bricks or tiles (or broken plates) to stop moisture wicking up into the wood. This will make the legs last longer.
Length of hive.	For a single hive I recommend a finished internal length of at least 1100mm (not 900mm as in Biobees instructions. Our bees are more vigorous and our weather milder so our bees build comb and can run out of room a lot faster than their UK counterparts.

Getting Kitted Out For Beekeeping

I love bee keeping, it is the only time in my life I have been a size 6! If you are new to beekeeping I recommend buying the full zipped hood bee suit. Some may think it is over kill, but I think it gives the new beekeeper confidence with bees. This suit is like a white cotton boiler suit with an attached zipped hood. It has elastic at the ankles and wrists to keep any curious bees out. Buy one too big rather than a little bit too small. Children's sized bee suits are also available. On line suppliers in New Zealand include:-

Ceracell www.ceracellbees.co.nz

Ecroyd www.ecroyd.com

Along with the suit you need gloves of some description. Washing up gloves will suffice but long sleeve leather gloves are the "Rolls Royce" choice. Gumboots with thick socks are the last fashion accessory for any discerning bee keeper. Plan to spend around \$150 for a full bee suit (obviously a simple hat and veil will be a lot less) and \$40 for leather gloves with arm gauntlets. By looking on Trademe or advertising at your local beekeeping club you may be able to find some second hand gear.

If you have ever wondered why bee suits are white, it is because it is a calming colour for bees. Blue does the opposite, it can make them aggressive, so forgo the Levi's when you are with your bees.

As your confidence grows when handling bees you may even become one of those beekeepers who only use their bare hands to handle their frames but for now don't earn any brownie points for bravery! Bee keeping is not going to be enjoyable if you are getting stung when you open up the hive. Interestingly regular bee stings are a natural way to prevent arthritis. This is backed up by many experienced beekeepers.

Other Beekeeping Equipment

The great thing about Top bar hives is that you don't need all the many extra boxes, frames and other paraphernalia which comes with conventional hives. All that the bees need is in the top bar hive. There are a few other pieces of equipment you do need to manage the hive, but these are things that you can rob from the kitchen.

The first thing you need is some sort of hive tool. Buying a hive tool is not necessary, A bread knife will suffice. This knife is used, not as a weapon against the bees, but to help lever off the top bars when you need to examine them. Bees come with their own super glue called *Propolis*. This is a secretion they produce to stop up any holes or cracks in the hive. The top bars will be fastened down with this propolis so you need to use the bread knife to gently lever and break the seal before moving and lifting the top bar. The knife is also used to gently cut any comb away from the sides of the hive. To remove a top bar comb gently slide the knife both sides of the comb from **the bottom up**. This will gently cut any bridging comb from the sides. It is really important to do this every time you want to remove a comb and then slide the knife between the two adjacent top bars. If you just pull the top bar out you will most probably lose the comb as it will tear from the wooden bar and fall into the hive!

Phillip Chandler, on his website www.biobees.com, suggests a plastic spray bottle filled with cold water and a splash of cider vinegar. This spray bottle is used in place of a smoker to encourage the

bees to move back into the hive rather than flying up between the top bars as you remove them. The bees go down apparently thinking it is raining. I don't use a smoker as top bar bees don't get as defensive as bees in a conventional hive when you open up the hive. Smokers always seems to go out which drives me crazy and if you use a smoker it sets the hive back a couple of days in production as smoked bees gorge themselves on honey in preparation for flight. One theory behind a smoker is that when the bees smell smoke they believe it is a bush fire and gorge themselves on nectar and honey in preparation to escape from the hive. With full tummys they are more docile and relaxed (a bit like us after a Christmas dinner in the middle of a hot summer) and are less inclined to sting, or able to, as they can't bend to sting as their tummys are full.

Finally you need a soft bush to sweep any bees off comb or off the hive when replacing the top bar. I just use a nylon brush from a dustpan and brush set but you can also use a large seagull feather or buy a hive brush for around fifteen dollars.

If you are hoping to harvest some honey comb you also need to have some sort of lidded container nearby to place the honey comb in. A lid will stop bees following you inside the house to get their honey back. I use a clean plastic bucket with a clean tea towel thrown over the top as a lid.

Most of this equipment you can store in the hive between the follower board and side of hive so it is always ready for you to use.

Getting Bees Into Your New Top Bar Hive

You can buy bees, catch bees or if you are very lucky bees will adopt you!

I got my bees by catching a swarm. Something for free, is always the best way! Indeed with a Top Bar hive this is probably the best way to acquire some new bees. Bought bees (Nucs) come on conventional frames which obviously don't fit into a Top bar hive. It is possible to cut down these conventional frames with strong pliers and trim the sides so they can fit into a Top Bar Hive. Phillip Chandler has a video on his website (www.biobees.com) showing how to do this. This procedure needs to be done whilst angry bees are flying around your head protecting their brood and queen. This is a big ask for anyone, especially somebody new to the hobby of bee keeping. Catching a swarm is actually much easier and more fun.

Packaged Bees

Another alternative is to buy a package of bees. A package is literally a bundle of workers with a caged Queen. They are sent to you in a box without any frames or brood. It is a matter of sweeping them into the hive, blocking up all but one entrance holes and hoping they like where they are and take up residence. The Queen will eat her way out of the cage within a couple of days and the workers will get busy building comb for her to lay in. There is always a risk that this 'package' may fly away to look for another residence. There are several NZ companies who offer packaged bees including:-

- Kintail Honey kintail_honey@xtra.co.nz
- Apiflora apiflora.nz.ltd@xtra.co.nz

Swarms



Hiving my swarm of bees by gently sweeping into hive.

Bees swarm in response to their natural instinct to reproduce, mostly in spring and summer. A new queen is produced and the old queen will leave the hive with half of the workers to make a new home elsewhere. A swarm of bees is an impressive sight. They will fly from the hive into the sky and form a large dark swirling cloud, landing in a tight ball. Hopefully they choose to land on a branch of a tree within your reach. Then it is just a matter of holding a large box or basket under the swarm and cutting off the branch, letting the football like cluster fall into the container. Place a sheet or light cover over the container but with an opening so any stragglers can get in. Bees are less likely to sting when swarming as their tummys are full with honey in preparation for the flight. But don't be a hero, wear your bee suit and if you have never done this before get a bee keeper friend to help. Get on the list for new swarms by contacting your local bee keeping club.

Find out about local clubs from the New Zealand National Beekeepers Website (www.nba.org.nz).

To get the swarm into the top bar hive remove the middle section of the top bar's and pour, shake or sweep the bees into the hive. I smear a little honey inside the hive to entice them to stay. When the large cluster is in, gently replace the top bars. Allow around 8 bars and then use the follower boards either side to surround the cluster of bees. Close the hive and let them get on with settling in. You may see bees fanning their wings around the outside of the hive entrance. They are telling any stragglers where their new home is. If it is a small swarm, say the size of a large tennis ball, as opposed to a soccer ball, block two of the round entrance holes with cork or a rag. This makes it easier for a small colony to protect and guard itself. Within three weeks when new brood is hatching you can open these holes.

You may be lucky enough to entice a passing swarm into your hive on their own accord. Rub the inside of a new hive with beeswax, lemon balm herb, a stalk of lemon grass or a few drops of citronella oil. Apparently bees are quite partial to these smells!

Top bars in Langstroth hives

If you have a friend with a conventional hive you may be able to persuade them to allow you to lay some new top bar's from your hive in the brood super of their hive. Three or four is probably the minimum. The idea is that hopefully the bees will start building comb off your bars and lay brood. You can then remove these bars with brood comb and nurse bees into your top bar hive and with a new queen (or queen cells) start your new colony.

Keeping it Legal- Registering Your Hive.

Now you have your hive, and new bees, it is a legal requirement to register your hive with AsureQuality, which is an off shoot of MAF. Fill in an on line application form here (<http://afb.org.nz/performs/3>). The application will ask you for details of the hive such as the location of hive on the property and also requires map coordinates and grid references. Trampers often have these grid reference maps.

If you know anyone with a GPS system you can use these to plot the hive location. Maps can be downloaded for free at <http://www.linz.govt.nz/topography/topo-maps/map-chooser/index.aspx>.

It costs around \$30 per year to register a hive. All new bee keepers are given a registration code which must be marked on the outside on one hive from each apiary. Every year before June the 1st you must fill in an Annual Disease Return. This will be mailed to you. It is just a form to update details, change of ownership of any hives and a record of any American Foulbrood found in your hives.

Another reason why your hive has to be registered is because once a year a bee keeper with special training will inspect your hive for disease. The main disease they are on the look out for is American Foul Brood. If this is detected the hive and bees have to be destroyed. The bees are killed and the hive and honey is burnt. The inspector will go through every frame of the hive. These inspections happen in Spring and before November. As the hive owner you must complete a certificate of disease inspection for the authorities by November each year.

It is a good idea to be involved with these disease inspections as it is a great opportunity to learn through observation. Contact your local bee keeping club and become involved. You can sit a test and become DECA qualified and even carry out these inspections yourself in time. Bee keeping clubs hold half day training courses and exams so bee keepers can be DECA (Disease Elimination Conformity Agreement) certified. A DECA is contract that you have between you and the management agency on how you manage your hives to eliminate any incidence of American Foulbrood.

Visit this website for more information. American Foulbrood Pest management Strategy
www.afb.org.nz

You can download a DECA template form on Save Our Bees Website.

Varroa treatment

Varroa is a relatively new scourge in New Zealand. It was introduced, by accident, in 2000 (Pundyk, 2008). It was first found in Auckland but over a very short time has spread through New Zealand. Australia is now the only country in the World without varroa. Varroa is a mite, the size of a pinhead, that lives on both the larvae and adult bees. Large infestations will weaken the hive and destroy it. It is said that if you observe a varroa mite moving across a comb the hive has such a large infestation it only has 2 weeks until total collapse.

Varroa mite on Drone brood



It is important to treat your hive twice a year, once in Spring and again in Autumn when you have harvested the last honey for the season. The reason for treating the colony at this time is that there are not many larvae around, which varroa feeds on, so you will get a good kill rate. Come Spring newly laid larvae should be pest free. The Autumn treatment is the most crucial as it is very important that the varroa numbers are eliminated as the bees go into their winter rest period.

There are several commercial preparations you can buy from bee keeping supply stores. As resistance to some preparations is becoming evident it is extremely important to alternate products from different chemical groups. Most commercial treatments come in easy to use plastic strips. Two of these strips are inserted into the brood camber and left for 6-8 weeks. It is very important to remove them after this time or mite resistance can develop. It costs around \$20 dollars a year to treat each hive for varroa.

I insert the strips close to the entrance holes so bees leaving and returning each day from the hive are treated.



Bayvarol strips being inserted into hive in brood area.

The Top Bar hive design helps with integrated pest management of varroa. The mesh floor allows any varroa knocked off adult bees to fall out of the hive. Varroa numbers can also be monitored by placing a piece of sticky paper under the mesh floor and counting varroa numbers. As Top Bar bees build their own comb they naturally build the comb slightly smaller than if building using foundation frames (Foundation comb is made bigger so that the bees are forced to fill with more honey). Varroa prefers larger sized comb so there is some evidence that the Top Bar hive creates a natural resistance to varroa.

Another organic way you can control varroa is to dust your bees with icing sugar. I do this by placing icing sugar in a cheese shaker, or similar, and dusting the bees when I am inspecting the comb. The theory behind this is the bees will groom themselves and knock many varroa mites off in the process.

There are some organic varroa treatments available. There are conflicting reports on their efficiency, but you could plan to use them alternatively with the mainstream treatments and monitor their success. Apilife Var is a thymol based treatment. As with most organic treatments it is most effective when daytime temperatures are above 15 degrees.

A way to monitor the effectiveness of your varroa treatments is to conduct a 'sugar shake' test before and after a varroa treatment. This may seem cruel but it does not harm the bees.

Method- Using a small glass agee jar with a screw top, mesh lid (I use some fine windbreak netting) collect around 300 bees. They should fill the jar by a third. Add 1 desert spoon of icing sugar through the mesh lid. Gently roll the sugared bees for about 10 seconds to coat with sugar. Turn the jar upside down and vigorously shake the jar over a white plate. The mites and sugar will fall through the mesh. Release the bees back near the hive. About 75% of the mites will be recovered from a sugar shake (Goodwin and Taylor, 2007). If you conduct this test before and after a varroa treatment you can monitor its success.

American Foulbrood and other Bee Diseases.

When ever you are in your Top Bar hive either taking honey off or checking on your bees always take a few minutes to check brood frames for health. I highly recommend sitting an American Foulbrood Recognition and Competency test. These are held throughout the year through local bee keeping groups. Take up every opportunity to help with other hive inspections so you can build up your skill in recognising what healthy and unhealthy brood looks like.

Because the comb in a Top Bar hive is being replaced regularly it can be argued that this helps to prevent disease build up as can be the case in foundation comb which is used over and over again in a Langstroth hive. Buy or borrow books on bee diseases so you can recognise them if confronted with a strange looking brood pattern in your Top Bar Hive. Two books I recommend are:-

Elimination of American Foulbrood Disease without the use of Drugs by Mark Goodwin
Control of Varroa- A guide for New Zealand Beekeepers by Mark Goodwin and Michelle Taylor.

Both these books can be bought from the NBA website and are about \$35 each. A wise investment.

Here is a brief summery of the most prevalent bee diseases in New Zealand

American Foulbrood.

Caused by an infectious bacteria. Check each brood fame in every hive at least three times during the Spring. Open any odd looking capped larvae and check colour and state of pupa every time you check brood frames.

Visual Symptoms.

- Cell cappings are sunken and darker in colour than healthy capping's.
- Irregular holes in cell caps
- A irregular 'spotty' brood laying pattern
- Infected brood are milky brown to black in colour (Healthy brood is white).
- Brood is slumped at the bottom of the cell
- Infected pupa have a outstretched pupal tongue across the cell wall. If you see this you definitely have AFB.
- There can be a 'fishy' smell to the infected brood.
- When infected brood is pulled from cell by match stick it stretches into a long sticky rope.

Treatment

- Kill all bees in hive and burn hive, frames and honey within 7 days.
- Inform the management agency within 7 days (Goodwin, 1999).

Sacbrood

A viral disease that is easily confused with American Foulbrood.

Visual Symptoms

- similar perforations in capped brood as AFB
- Infected pupa change from white to yellow, to brown to grey and then to black.

- Infected pupa has a two-tone, mottled colour.
- The infected pupa has a raised head in cell
- Does not form a rope when pulled from cell

Treatment

- Requeening will normally cause the symptoms to disappear.

Chalkbrood

A fungal disease affecting the brood.

Visual Symptoms

- perforated cappings
- larvae very white and chalk like.
- Larvae never rope out of cell

Treatment

- Requeening

Parasitic Mite Syndrome

When varroa levels in a hive reach extreme levels brood starts to show a range of disease symptoms. These are known as Parasitic Mite Syndrome.

Visual Symptoms

- Cell cappings can appear dark, sunken and perforated.
- Pupa are stretched out at bottom of cell.
- Pupa may spiral up walls of cells and can be easily removed with a matchstick.

Treatment

- When symptoms are evident the colony is close to death but immediate varroa treatment may save the colony and the PMS symptoms will disappear.

Half Moon Syndrome

Cause is not fully understood.

Visual Symptoms

- The symptoms very closely resemble AFB with spotty brood laying pattern, curved larvae, perforated capping's, discolouration and a nasty smell.

Major difference is the appearance of multiple eggs in each cell.

Treatment

- Re-queening normally cures but it is recommended to get second opinion from expert bee keeper as so closely resembles AFB.

Tutin Toxic Honey

Toxic honey is produced as a result of honey bees feeding on the Tutu (*Coriaria arborea*) bush. This is a New Zealand native shrub which is often found in gully's and regenerating bush. It is not actually the Tutin bush which is poisonous but the honey dew, a sticky sap produced by the vine hopper insect feeding on the Tutu plants. It is this honey dew which the bees collect which is toxic to humans.

The toxic honey looks, smells and tastes exactly the same as normal honey. Heating or processing of any kind does not effect the toxin. Both comb and extracted honey can be poisonous. Comb honey can

be potentially more dangerous as it can contain higher concentrations of the toxin.

Areas in New Zealand to be especially vigilant about toxic honey are :-

- Coromandel Peninsula
- Eastern Bay of Plenty
- Marlborough Sounds
- East Cape (Gisborne-Wairoa) areas.

To produce toxic honey these situations need to be occurring:-

- A number of Tutu bushes growing within 5 kilometres of your hives.
- High numbers of Passion Vine Hoppers
- Hot dry weather which prevents the honey dew from being washed off the plant.
- A lack of other food sources for bees in the area

To prevent any poisoning from toxic honey it is recommended to :-

- Harvest honey in early January to avoid toxic honey period (Feb-march).
- Stir honey well to dilute toxic honey stored in a couple of cells.
- During February and March, and especially in hot, dry summers don't eat comb honey if hive in at risk areas.
- Get honey sample tested in lab (cost around \$30)

Website to visit New Zealand Food Safety Association

www.nzfsa.govt.nz/animalproducts/publications/info-pamphlet/bee-products/toxic-honey.htm.

Swarming

If it is one thing that is on the minds of bee keepers in spring and summer, it has to be swarming.

Swarming for bee keepers means they lose half the workers and a queen from their hive, which means half their hives productivity lost for the honey season. On the other hand, swarming, for bees means a greater chance for survival as a new colony is created.

If you want to keep your bees in a natural state as possible then swarming is a natural process and progression of your colony. However if you live in an urban setting, a swarm of bees can strike fear and loathing in the minds of your neighbours and passerbys!

One option is to let a swarm escape but be ready to catch and re-hive. Great if you want to increase your hive numbers or know somebody wanting their own colony. A bad idea if you can't be at home hanging around for bees to make up their minds to swarm.

The Top Bar hive allows you to create an artificial swarm very easily so that the bees feel as if they have swarmed and you end up with two colonies! You can only do this procedure during Spring and Summer when you believe your colony is preparing to swarm. Some of the clues you are looking for include:-

- seeing lots of capped drone brood (this brood is larger and raised unlike worker brood which is generally flat)

- seeing lots of drones flying around the hive or inside if you have an observation window.
- Bees running out of room inside the hive.
- Queen cells being built around the edges of the comb. They look like thimbles. They are long and round. If you see these you can be pretty sure that a swarm will fly within the week.

Creating an Artificial Swarm

On a warm, still sunny day when you have seen the above signs it is time to create an artificial swarm. Open the hive and move the follower board way from the top bars with comb. Gently remove the top bars, using the technique of gently cutting with a bread knife upwards along the hive sides. You are looking for brood with queen cells that are intact. Remove all brood comb with queen cells. You may need to go through all the top bars to ensure you remove **all** Queen cells. If there is only one then take another two combs with capped brood. Don't shake the bees off the comb. These are the nurse bees looking after the brood. It is very important to check that you don't have the Queen bee. **She must stay with the original colony.** Take these three or four bars of brood plus one bar of capped honey and place in a new Top Bar Hive or at one end of your original hive. (The longer type is best for this and you need an extra entrance hole on opposite side). Place the top bars hard up against the end of the hive with the follower board separating the two colonies. If your hive has a solid base, no problem. My hive has a mesh base and I find that bees can still slip under the mesh into the other section. To prevent this I tack a narrow batten of wood on the outside, under the follower board to form a tight seal. This is important as you don't want the queens from the two colonies trying to kill each other.

Days of Our Hives

In a colony there are three types of bee. Each has a specific job or function to perform. The worker bee is very correctly named as they do all the work to maintain a thriving hive. They are all girls. They work together, each performing a certain job depending on their age. When they are first born they spend their time inside the hive attending to the developing larvae, cleaning the hive, feeding the Queen, disposing of dead bees outside, guarding the hive entrance, mending cracks inside the hive with propolis, and building comb using a special wax gland on the underside of their abdomen. As they grow older they leave the hive each day to forage for nectar and pollen. In the height of summer a worker bee only lives for 6 weeks as they are literally worked to death. They have a sting which, if used, will kill them as it pulls away part of her body. When they sting they release a pheromone which alerts other bees to sting in the same place. If you are stung when attending your hive puff smoke around the area to deter others from stinging.

The Drone bee is larger and furrrier than the worker bee. They look like they are wearing Raybans as they have large black eyes. They don't have a sting. Their only role in life is to mate with a Queen and pass on their genes. They live the life of 'reilly', basically swanning around, watching TV and having their meals, washing and work done for them. Sound familiar? On a sunny day they will go for a afternoon flight outside the hive and then return to be pampered by the workers. The girls get their own back. Come late Autumn the Drones are barred from re-entering the hive and starve or freeze to death. There is no point feeding them over the harsh winter.

The Queen bee's only role is to lay eggs. She can lay around two thousand a day. She emits a pheromone which binds the hive together. She is the largest bee, long and slender. Her sting is un-barbed so she can sting many times. She uses her sting to kill emerging sister queens. She only leaves

the hive once to mate with drones in mid air and then return to the hive to start laying eggs. You will spot her in the hive, she is the largest bee with a circle of workers forming a ring around her. They are grooming and feeding her and receiving instructions through her pheromones. A queen can live for years in some instances. When a queen becomes old or sick her pheromones change and this signals the worker bees to raise a new queen. Sixteen days later a new queen emerges and kills her ailing mother to take over the hive. This is called supersedure.

How bees make honey and how to harvest it from a Top Bar Hive.

A worker bee will visit a flower and using its long tongue will drink nectar filling its stomach. When the bees stomach is full the bee has almost doubled its weight. Returning to the hive the bee will transfer the nectar to a hive bee by regurgitating it into the waiting bees mouth. This nectar is then transferred to several bees through the hive. Chemicals in the bees mouth change the complex sugars of the nectar in to simple sugar which the bee's find easier to digest. This nectar is then deposited into the waxy hexagon shaped cells. The nectar is still very runny at this stage so the bees fan the liquid with their wings to evaporate excess water. The resulting concentrated liquid becomes honey which is then capped with a layer of beeswax and stored until required by the hive. This is normally in winter when flowers are not producing nectar.

So basically that stuff you have on toast each morning is sicked-up, regurgitated, chewed, spat out, winged dried excrement stored in a container made from insect bodies, harvested from thousands of insects running all over your honey with tiny hooked feet and hairy bodies! Gosh, but isn't it yummy!

Honey is one of the few foods that will never decay. Thousand year old honey has been found in the Egyptian pyramids buried with the Pharaohs .

To harvest honey from a Top Bar hive you require your bee brush or large feather, a long knife (bread knife), your bee suit and gloves, a large lidded bucket and a smoker if you wish. Choose a still, warm day. Avoid any time where it looks like thunder storms are looming. Thunder storms can make bees aggressive. During late Spring and Summer when there are lots of flowering plants around you will need to visit your hive at least every 15-20 days to check the bees have enough space, perhaps add more bars and to harvest honey. I find in summer I harvest around two full top bars of honey every three weeks. That seems to equate to around 8 good sized bottles of honey every three weeks.

Gently open up one end of the hive by removing the follower board. The bees will store excess honey at either end of the hive. The brood will be in the middle around the entry holes. Carefully slide the knife **upwards** along each side of the hive to cut any comb which may be attached to the side of the hive. Slide the knife between the adjacent top bars. Lever the knife under the top bar to break away any propolis seal and then gently lift the top bar straight up and out. It is very important to always hold the bar so the comb is vertical to the ground. If you swing is horizontally it can easily break away from the bar. What you are looking for is a bar full of capped honey. It should look white. If you can see new comb or comb filled with nectar but not yet capped return it to the hive for a little longer. Remember to replace in same order.

To harvest, gently brush the bees off so they land either inside the hive or in front of the hive and then quickly cut the honey off the top bar, leaving about 3 cm of comb along the top bar. Replace the bar on

the outside of the other bars. The bees will eat the remaining honey and start rebuilding the comb. Place the honey inside the lidded bucket to prevent the bees from trying to get it back. It is a good idea to do this in the morning around 10am. At this time most of the forager bees are out and about but it is cool enough for the combs to be firm and the honey is not as runny as in the middle of a hot day. It can be a sticky process never the less.



Capped honey in hive and on top of hive ready to be harvested.

Disaster can and does happen. It is very easy for the fragile comb to break off the Top Bar and it is only with practice that you will come better at removing and checking the combs. If a comb does break and fall off and has developing brood, gently prop it up the between two hanging combs. The brood will still be fed and nurtured and when all the brood has hatched you can remove the empty comb from the hive. Don't despair I felt as if I was wrecking every comb, each time I went into my hive in my first season. Luckily the bees seem to be very forgiving. The new white comb is especially fragile but becomes tougher as it ages and turns a rusty colour.

Back in the kitchen with the doors and windows closed, to prevent bees from following you, you can extract the honey. I will often cut up some of the honeycomb and place in a glass jar and then cover with runny honey. To extract the honey from the comb place it all in a large bowl and crush the comb with a potato masher and strain through sieve into bowl. The filtered honey can then be bottled. A warm day is best for this as it helps the honey flow faster. As the honey is not heated it retains all of its important vitamins and minerals so is the best honey to consume. You will notice different shades and tastes to your honey as the season progresses depending on what your bees are feasting on in the garden. Save the precious wax to make furniture polish, candles and creams.

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