

Beekeeping 101



Frank Lindsay 2018

In your first year of beekeeping:

You must learn how to light a smoker so it keeps going,

How to use the smoker and

How to requeen a hive.

- **Beekeeping is mostly observing and reading the hive.**
- **Anticipating what is likely to happen next and planning for that by perhaps adding a super, feeding the hive or requeening a hive early.**
- **Beekeeping is nutrition, nutrition, nutrition.**

- **Sighting the apiary is important – morning sun in winter.**
- **Face it away from washing lines.**
- **Away from high traffic areas.**
- **Plant or build a barrier in front so bees fly high**
- **Paint in pastel colours - warms up quicker in the sun.**
- **Blend into the background. White hives can alarm the neighbours.**
- **Use bee-escapes to remove honey supers**
- **Extract in the evening after bee flight activity has finished**
- **Put the wets back on after dark - fresh honey supers excite bees.**

- Provide a water source.
- Don't allow the bees to rob.
- If robbing starts, cover the entrance with grass and turn on the sprinkler for half an hour.
- Bee tidy - don't drop wax and bur comb.
- Don't let your hives swarm.
- Requeen yearly.
- Don't open a hive if your neighbour is gardening or mowing the lawn.
- Work in with your family's wishes.
- Be aware of your community











Belmont



Richards apiary



Point Howard



Silverstream

What type of hive?

- **Select the size/s of box you can handle.**
- **Commercial's use 10 frame full depth boxes.**
- **Hobbyist's go for 3/4 boxes.**
- I'm happy with two full depth brood boxes and 3/4 honey supers but I also have a lifter on the back of my truck.
- **Australian's use 8 frame boxes - lighter and easier to transport.**
- **Long hives / bench hives - add supers for honey.**
- **Ladies or young beekeepers - put frames in a nuc box to carry.**
- **Learn to lift by bending your knees.**
- **Work a hive on your knees (using a pad) so your back is always straight or put the hive on a stand so you are not bending all the time.**



Become confident

- **Practise on an empty propolised hive**
- **Withdraw frames without touching another frame or the side of the super. Important not to roll the queen and kill her or other bees.**
- **Select your day if you can – a warm day when it's possible to work with roll up your sleeves (15°C) means it's warm enough to work the hive.**
- **Don't open hives immediately before a storm.**
- **Leave the bees a day after rain to recharge their pollen stores.**
- **Have somebody check that your zips are fully done up.**
- **If nervous, count down from 10 to relaxed.**
- **Don't be sweaty.**

- **Don't wear a watch or have perfume or use a floral hair shampoo.**
- **Ladies tie back long hair or wear a scarf so bees don't get caught in your hair.**
- **Don't wear woollen socks or a felt hat.**
- **Consider latex gloves rather than heavy leather gloves.**
- **Be gentle and smooth in your actions – there's no hurry.**
- **Learn to accept bees on your hands.**
- **Learn the reactions and sounds of the hive.**

- **IF YOU LOSE CONTROL – CLOSE AND LEAVE FOR TWO DAYS**

Other considerations

- **Provide top ventilation in your crown board** - 25 mm entrance on one side or
- **Consider insulating the hive in the winter** - polystyrene under the roof as a minimum.
- **New beekeepers put hives on individual stands** - vibration alerts bees.
- **Start with two nuc hives.**
- **Light the smoker before you approach the hive.**
- **Approaching the apiary** - the guard bees have already seen you.
- **Smoking the hive is very important.** Only use enough smoke to overwhelm the sense of smell to stop the alarm pheromone spreading within the hive.
- **Over-smoking a hive stops all foraging activity for 12-24 hours.**



Inspecting a hive

- **Give the smoke time to work. (2 minutes between puffs).**
- **Start the inspection in the bottom super. If other supers are removed, put on the up-turned lid or stand and cover the exposed frames with a hive mat or cloth.**
- **Waft a little smoke periodically over the bees to keep control.**
- **Try not to squash any bees - transmits alarm pheromone and Nosema to other bees.**
- **Prevent bees being squashed when replacing supers by inserting a second hive tool as a wedge between the supers.**
- **Keep entrances small - 200 X 9 mm - look at a feral hive entrance.**



- **Know the Biology of the Bee**

- Bees are dependant on good quality pollen.
- The bees know within 15 minutes what the hive requires from chemical / pheromones produced in the hive by larvae, the nurse bees and the queen.

- **NURSE BEE VISITS TO LARVAE**

- 1300 bees inspect and visit each larvae, feeding them 2% of the time.
- They make up to 7200 visits per larva.
- Requires 650 bees cap cells.
- Requires 60 bees clean cells.
- Queen larvae fed 1600 times (over total of 17 hours).
- Worker larvae fed 143 times (2 hours).

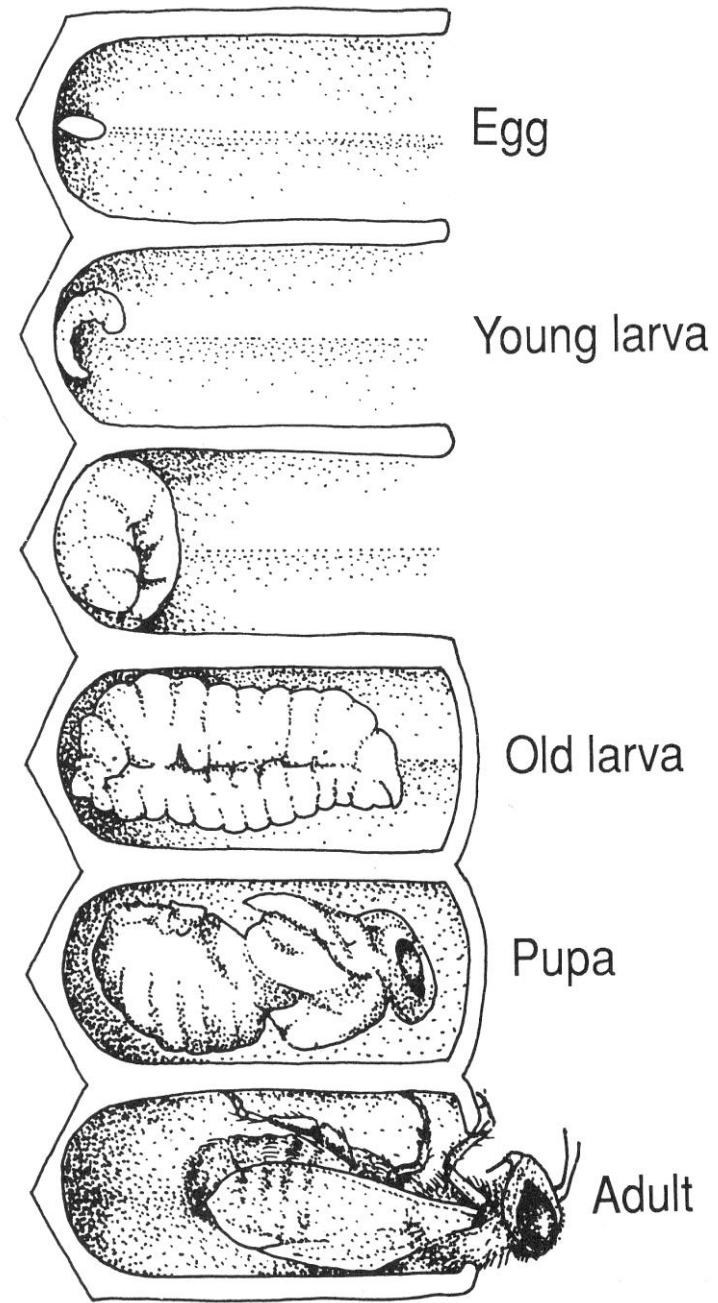
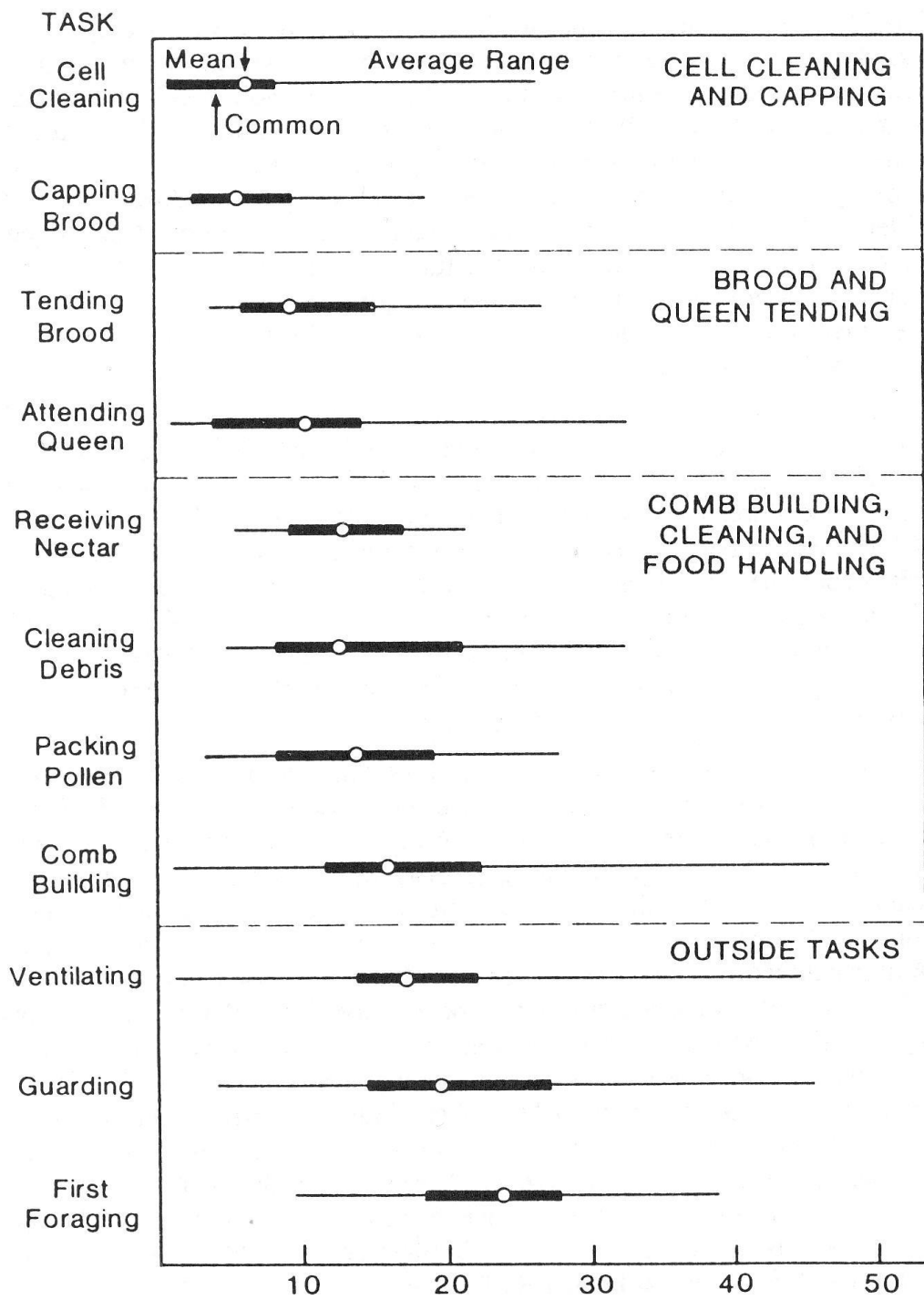


FIGURE 4. The major stages in honey bee development.



A hive requires

- **30 kg of pollen and between 20 to 60 kg of honey.**
- **Poor nutrition during the first 8 days of development determines a worker bee's life span and activity.**
- Poorly fed worker bees will only have two ovaries, are often capped early, become nectar foragers and don't live very long.
- **Well fed worker bees have 8-12 ovaries**
- **These bees are mostly pollen gathers, live longer in the field.**
- Vitellogenin (fat bodies) allows winter bees to live 6 months but as soon as they start feeding brood, their life span changes to that of a normal worker.
- **Pollen supplements are still not good enough on their own.**



POLLEN COLLECTING

- A bee spends 10-187 minutes collecting pollen.
- Bees collect a pollen load of 0.0035-0.0042 ounce (100-120 mg)/ trip or about one-half their own body weight.
- A colony collects 40-125 pounds (18-57 kg)/year.
- 500-600 square inches (1270-1524 cm²) of stored pollen reserves is needed for winter.
- 15-30% of foragers collect pollen, visiting 50-350 flowers per load.
- Bees make 1-50 trips/day collecting pollen.
- There are 20,000-6,000,000 pollen grains on one bee, depending on flower species.
- 250 gm of pollen collected in one day = 17,000 flights by foragers.
- Amount of pollen collected per day = 26-71 ounces (740-2000 gm).
- One colony can eat 44-65 pounds (20-30 kg)/year.
- **1 frame of honey, plus 1 frame of pollen, plus water makes 1 frame of bees.**

(Reference from The Beekeepers Handbook)

Reading the nutrition of the hive

- **Bees in a hive turn over every 42 days**
- **The flying bees = looking back at nutrition 4 - 6 weeks ago.**
- **House bees clustered in the honey super = 4 weeks ago.**
- **Emerging Bees = 3 weeks ago – flick off capping to check health.**
- **Conditions now – Is there pollen around the brood?**
 - Are the 2 day old larva floating in royal jelly?**
 - Is the colony producing drones?**
 - If yes to all = good nutrition.**
- **Did you know - Foraging bees don't eat pollen.**
- **Foragers are fed by nurse bees - royal Jelly.**

Good reference material

- [George Imirie's PINK PAGES](http://pinkpages.chrisbacherconsulting.com/)
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- RIRDC now [AgriFutures Australia](https://www.agrifutures.com.au/) <https://www.agrifutures.com.au/>
Fat Bees Skinny Bees by Doug Somerville

Influential beekeeping books:

- **Fifty Years Among the Bees** by CC Miller
- Learnt about handling nucs. Just having an inch air space under the frames allows an extra frame of bees to be accommodated in the nuc and therefore less swarming.
- **Some Important Observations in Bee Management** by TSK and MP Johanson - alternative ways to do things.

Read all the old bee books.

- **Download from the Cornell University archive –**
<https://archive.org/search.php?query=fifty%20years%20among%20the%20bees&sin=TXT>
- Old books have more information - Most are the work of a life time of trial and error perfecting a technique like queen rearing.
- **Ohio State Beekeepers Assn has "Bee Hunting" by John Lockard and**
- **"How to Grow Queens" by Walter Kelly**
- <http://www.ohiostatebeekeepers.org/resources/beekeeping-books/>
- **Nothing has changed in 150 years just what we use - now plastic and stainless steel, however bees prefer wax frames.**

Getting information off YouTube

- **Randy Oliver's Scientist Beekeeping** www.scientificbeekeeping.com
Randy puts everything together and is well worth listening to.
- **Apinz presentation last year.**
<https://www.youtube.com/channel/UCD1t9KlupoFbGne3ZUsMo3g>
- just YouTube, Randy Oliver, ApiNZ
- **Guelph University website** - 30 different short videos.
https://www.youtube.com/watch?v=mtfzz_v8KU
- **Beekeeping tips with Robin Darlington** - different type of hive, based on the Dadant hive. https://www.youtube.com/watch?v=0Xs_OVI25lw

Managing swarmed bees

- **Tom Seeley's Honey Bee Democracy** - How a swarm finds a new home and how they signal to get the bees to warm up ready to fly to their new home is shown in Swarm Intelligence.
https://www.youtube.com/watch?v=1x8T_CHZemE

TIPS

- **Robbing is now a big problem – put on robbing screens**



Swarm prevention:

- **Spring nine day quick checks** - split the hives when queen cell production starts.
- **Keep all swarms or second hand gear isolated from your gear for 18 months.**
- **Don't let a ring of honey develop above the brood area.**
- **Interspaced foundation with drawn frames above the brood nest.**
- **Scales under a hive** - Broodminder scales for \$US250 each.
 - during the lemon wood flowering, a hive put on 5 kg per day.
- **MITE Control:**
- The Canadians are well ahead on alternative techniques for Oxalic Acid and Formic Acid. We arranged for Rob Currie (2014) and Medhat Nasa (2016) to our NZ conferences to skill up our beekeepers.
- **A colony with <1% mites produces double the honey crop than a colony with a 5% infestation.**

Finding a queen

- Why do you want to find a queen - only to replace her.
- Mid-morning the queen will be in the second super on the third frame in on the sunny side of the hive.
- In the afternoon she is likely to be in the third super (for those who do not use queen excluders).
- Generally if you are replacing a lot of queens, you tend to find the queens in the same place in each hive.
- Some queens run off the frames and are hard to find, look under the floor board.
- Use a queen excluder to divide the hive. Check after four days and look for eggs. The queen will be in this super. Still can't find her – move the super a few metres away, cover and leave it for half an hour. The field bees will have returned to the hive leaving the super de-populated making the queen easier to find.

Requeening Problems



- **Use a push in cage** where older worker bees cannot get at her.
- **Check for queen cells or eggs after 5 days.** (Emergency queens or a second queen in a hive).
- **Put new queen (caged) in with a package bee swarm** – treat at the same time for mites.
- **Queen supersedure.** Protect the queen front feet pads (arolium) when she is caged. Tape over part of the cage so the queen has a refuge.

FACTS

- **Queen is fed every 20-30 minutes at peak brood rearing.**
- **Queen larvae grow 1500-1700 times weight of the egg.**

Methods to keeps bees healthy:

- **Over-winter hives full of bees leaving plenty of honey** - honey is better than sugar.
- **Change brood frames on a 3-year cycle.**
- **Breed queens from your best hives that over-winter well.**
- **Don't overstock your apiaries** – there is a sweet spot as to the number.
- **Nutrition, nutrition, nutrition:** Plant early nectar and pollen sources near your hives - a few willows.
- **Practice good biosecurity: Work in ideal conditions.**
- **Don't go into the hives unless you have a purpose.**
- **Keep varroa levels below 1% = 50% more honey.**

Look out for exotic pests - Small Hive Beetle monitor



Family Health - bee venom

- Family members can become allergic
- Disrobe at the door and wash your hands before touching children.
- A bee can smell an old sting site and will react to it.
- Wash your gear after each stinging incident.
- Never wash your bee gear with the family cloths.
- Never carry used beekeeping gear in the family car - everything must go in the boot or on a trailer.
- Store gear and suits outside the house in a shed or the garage.
- Watch children especially around puberty.

All beekeepers at some time will have a bad reaction to a bee sting.

- Most bad reactions result in a rash over the body (itching), feeling faint, reduced eye sight to pin hole. Beekeepers generally come out of it within 5 minutes - severe but a non-lethal reaction.
- For an experienced beekeeper after a bad reaction, a sting a day later will have no reaction.
- **Some beekeepers do become allergic to bee venom.** Each reaction gets more severe. Consult your doctor. Take a de-sensitise course.

Beekeeping is a community thing.

What happens 2 or 3 km away can affect your hives.

Work in together treating varroa with the same chemical family and monitor the results. One untreated hive can take out a commercial apiary and all the hives around it.

Start Autumn treatments early February to produce winter bees free of mites.

Bees are a fascinating insect and you never stop learning.

There are lots of little tips that aren't in the books.

Last of all, enjoy your bees.

- **Queens will lay almost 2,000 eggs a day at a rate of 5 or 6 a minute. Between 175,000 – 200,000 eggs are laid per year.**
- **Beeswax production in most hives is about 1.5% to 2% of the total honey yield. 8 lbs of honey = 1 lb wax**
- **Honeybees are the only insects that produce food for humans.**
- **A single hive contains approximately 40-45,000 bees!**
- **Honeybees visit about 2 million flowers to make one pound of honey.**
- **A bee travels an average of 1,600 round trips in order to produce one ounce of honey; up to 6 miles per trip. To produce 2 pounds of honey, bees travel a distance equal to 4 times around the earth.**
- **Honey bees are one of the very few invertebrates that engage in a sleep-like behaviour, similar in many respects to mammalian sleep.**
- **Honey bees are one of very few invertebrates that produce a sort of “milk” for their young, Royal Jelly, which is the only food the larvae will eat in early development.**
- **Like other social insects, Bees have an advanced immune system.**
- **Bees have specially modified hairs on their body that develop a static electricity charge to attract pollen grains to their bodies.**
- **Bees navigate by using a combination of memory, visual landmarks, colours, the position of the sun, smell, polarized light, and magnetic anomalies.**