

From the Bee House Summer 2016-2017

The Spring that was....

They keep telling us that Beekeeping is local.

Listening to beekeepers North and South and East of us you get all different messages – some had a good start to Spring, for others it was slow and some even noticed some robbing.

Here, in the upper Mary valley we seem to have hit the middle. Spring started off very well with a good flow. I'm sure it would have all continued if we had more than a few showers but it is dry here.

The Blue Gum (or Forest Red Gum – depends where you are from) did very well here. We had a good flow and it lasted longer than usual.

We picked up some Clover honey – you will taste it. Last year the Spring honey was very pale thanks to a lot of Clover. This year was not as good as last year but OK.

I'm an optimist – if we get some of the storms which have been predicted and if the temperatures ease a little, the Clover will come back in some spots.

In the last two years we made splits on the Clover and hardly had a set-back on the hives. This year all the hives we split had a severe set-back and are just starting to pick-up mid-November). Many of the hives are strong in bee numbers and carry a lot of pollen. We need a good flow now to bring in some honey.

The forecast for the next few months is for warmer weather but near normal rainfall. It is the rain we need desperately here.

What is flowering?

The Eucalyptus toreliana's are budding well but are slow to come out here. They are flowering in more coastal areas. The Flatweed will be out with the Cobblers Pegs if we get some rain. I have not seen any Ironbark so can't tell you if they are budding well.

The Weeping Lilly Pilly looks very promising along the river. They are very reliable here. In other parts (eg Maleny) they have been flowering for a short while

The Silky Oaks are finished. The same goes of the Pecan Orchard which where prolific pollen producers this year.

Looking ahead a little I hope that the Angophora will do their bit – looking promising but too early to say and the Brush Box – but it is not reliable but we should be due for a good year. Mahogany too is due to flower soon.

And there is always the chance that Sub-Tropical Legumes will take off and they are a

weed along most of the hills and ridges.

Don't forget the Valley Bees Meetings every second Sunday at Kandanga. Always a good place to have a chat and learn something new.

And don't forget: with the rain the SHB will come too!

Enjoy your bees

Max and Trudi Lindegger



Bee basics: Home Truths about bees

Bees need food

Obvious!

Make sure you don't over-harvest. In our Subtropical environment it is generally sufficient to leave ALL the honey in the brood box plus say two frames of honey in the honey super for the bees.

You may like to leave more BEFORE the wet season and BEFORE winter – just in case the bees can't fly for a while.

Don't over-stock. Each area has a limited stocking rate. Calculate the number of hives your area can support during periods when not much is flowering and when dry weather reduces flowering even more.

References like "*The Honey Flora of Queensland*" by S.T Blake and C. Roff and "*Honey and Pollen Flora*" by Alan Clemson are excellent. You may find these books in second hand book stores or your local library.

Remember that bees need pollen and nectar sources to prosper. Keep your eyes focused on trees. Learn to recognise when trees are budding. Keeping records when trees flower is a great help in planning for the future.

Bees need a comfortable home

It is not important if you chose a conventional Langstroth Hive or a Top bar hive or a Warre or a FLOW hive. Make sure that your hives are positioned away from flood and fire and extreme wind. Hive stands will keep the bees away from moisture (and cane toads). Well-kept hives will have reduced SHB numbers – fewer hiding places for beetles means fewer beetles. Control SHB numbers by a means you feel comfortable with.

Bees don't need pests and diseases

Check your brood nest at least once a year – better twice a year. Learn to recognise diseases and how to deal with them.

Taking care of your Queen:

A common question: *“For how long can I keep a queen”.*

We are talking here about a queen you have just picked up from a queen breeder or had mailed to you.

The short answer is “for as short a period as possible”

The long answer is “it depends”

It depends if the queen has been banked - meaning the queen breeder had already stored the queen for a while. Some queen breeders do not “bank” queens at all. It very much depends on how YOU are storing the queen when you get home.

You will kill a queen very quickly if you expose her to sunlight. On a hot day – a few minutes and the queen is dead. Don't transport the queen in her cage with the cage sitting on the dash board. If I pick-up only a few queens I like to keep them in my shirt pocket – warm but not hot.

If you transport say 10 they will probably be supplied in a box. Keep the box in an ESKY or a Polystyrene box in a cool part of the car.

When you get home; if the weather is cool and you have stored the queen(s) for a day or two it is probably best to keep them in an ESKY with a wrapped hotwater bottle wrapped in a towel.

During warm weather wrapped in a towel will do the trick.

In each case make sure that the queens can not be attacked by ants or any other insect. Keep the queen in the dark and twice a day give her a drop of water through her cage. Looking at a number of references I find that a queen can survive for as long as 14 days.

Still, try to install the queen as soon as possible.

Cleaning used equipment:

I have not purchased or indeed accepted used equipment for free for a long time because I'm scared s...t- less of AFB. I do think that used equipment CAN be a source of AFB or other diseases. AFB can live for 50 years, some say 70 years, just waiting there to spread.

But I do re-use my own equipment. I fix boxes even when they are probably past their "use-by" date. Winter is a good time for this.

We also rotate frames regularly and replace old foundation with new. It makes extracting easy and seems to keep the bees happy.

Frames with old foundations:

My procedure is pretty simple. I cut the old foundation out along the top and bottom bar and along the wires. A sharp knife works well. Reasonable foundation I melt down, old, dark foundation I find is not worth the effort and I wrap it in big, strong plastic bags and place them in the garbage – No good to leave it in the open for bees to get attracted to any residual honey.

The frames – now mostly free of wax – are placed in a boiler and boiled at steam temperature in a wax melter for about 10 minutes, turned and boiled again.

I think that AFB would be killed at such a temperature but I can't give any guarantees. After this treatment I clean the frames with a hive tool.

As a last step I place the frames in a bucket of water with a cup of bleach for about 10 minutes, turn the frames and to the same thing again.

A quick wash with the hose, some exposure to the sun to get the bleach smell off, and a polish of the wires with steel wool and maybe a re-tightening of the wires with a crimper and it is all done.

Wort the time and effort? Not sure but it does feel good. I have frames with 1978 as the date on them and I'm absolutely sure that some of my Silky oak frames are even older.

Supers are a bit more challenging.

I generally clean them with a scraper, steel wool and sand paper and re-paint them. I guess to be 100% sure it is all free of any diseases you would have to take them all for irradiation.

Michael Bush has some good ideas to this theme. I don't think wax dipping would work here – too hot. But why not give it a go? <http://bushfarms.com/beesfaqs.htm>

Let us know how you deal with your used equipment!

What is happening to Bees Wax prices?

If you have been buying or selling beeswax in the last year you would have noticed that prices have gone up by a substantial margin. I can remember selling blocks of wax to a processor for \$ 5 only two years ago. Now people are willingly pay \$ 25 per kg.

There is a difference – wax foundation used to sell for about \$ 1.50 for a large sheet and most of the \$ 25/kg wax would be going into cosmetics.

The mark-up for foundation can't be very high as the equipment to clean and process the wax into sheets is quite expensive.

Australian wax has a reputation as “clean” wax – free of pesticides. In most cases this would be true as we don't have to use chemicals to deal with Varroa Mite and associated problems.

At the time of writing (mid - November) I find it very difficult to buy bulk bees wax sheets and I'm about to run out of the stock I have here. Some suppliers have run out (they can't get blocks of wax) and others are expensive and including the postage to us would mean that we would have to sell a Full Size sheet for about \$ 2.50. I gather that some suppliers in NZ have also run out of wax sheets.

Mind you, beeswax was probably too cheap for too long. ***It takes about 7 - 8 kg of honey for bees to make 1 kg of wax!***

So, in reality, the cost of beeswax should be 8 x the price of honey.

I don't think many would be willing to pay this sort of money for foundation sheets. I guess the cosmetics industry would be able to absorb it. It will be interesting to see where it all ends.

What next?

Professional beekeepers have moved to plastic foundation some time ago and more will follow. Plastic foundation used to be more expensive but no more.

It is possible to make your own foundation but it is not that easy and hardly “cheap”. The rollers are too expensive for most small beekeepers. Maybe a group could get together? Here is one example: https://www.google.com.au/search?q=beeswax+foundation+rollers&biw=1915&bih=975&site=webhp&tbm=isch&imgil=INFRnLHf-kltTyM%3A%3B0mA9NDtKDUowVM%3Bhttp%253A%252F%252Fjetclima.en.ec21.com%252FBeeswax_Foundation_Roller_Machine--7072211_7072249.html&source=iu&pf=m&fir=INFRnLHf-kltTyM%3A%2C0mA9NDtKDUowVM%2C&usq=_CMtthRdZ_AvsL862_zRY90znNWk=&dpr=0.8&ved=0ahUKEwjAwaydyoPQAhVJopQKHab7CwsQyjcIMQ&ei=iH-QWWMDdK8nE0gSm969Y#imgrc=Zw4oZMwvqgUoQM:

The Fat Bee man thinks it is easy – have a look here:

<https://www.youtube.com/watch?v=5IU3C4f2Xfc&list=PLz4ggNBMckMXR-mRenmjhhvryzBp3NocA&index=16> The plus is that you would use your own wax and you know what is in it (or not in it!)

It is of course possible that prices will come back to something affordable again but I'm not holding my breath.



Meanwhile.....save your wax and appreciate what a wonderful product it is.

Picture at left shows a selection of our wax products.

A word about Nuc's:

I made lots of splits this spring and plan to do a few more. The demand is huge and it is great to see all this interest in bees. But making splits does come at a cost to the hive you take the brood from.

In my case I take 3 frames of brood plus a frame of honey and pollen plus one drawn frame if available, or a frame with new foundation – plus a young queen and a bunch of bees. As part of disease management I take all these frames from the same hive.

Let's have a look what goes into a nuc in numbers:

3 frames of brood.

Looking into this a number of suggestions can be found.

It appears that a good frame could have up to 4800 cells with bees at different stages: counting both sides. Let's be modest and say 3 frames with a modest 3500 cells with eggs, larvae...each – a total of say 10000 bees about to emerge over the next few days and weeks.

For a discussion on this theme see here: <http://www.beesource.com/forums/showthread.php?256451-How-many-cells-are-there-on-one-frame>)

Now, we have of course also nurse bees on each. The figure quoted is 1600 bees per frame – add say 5000 bees.

The frame of honey also would bring along say 1000 bees.

This adds up to a total of 16,000 bees!! **Holy cow!!**



Picture at left: Frame with brood.

This explains why the honey production is taking a hit in the hives where I take splits from – the hive is missing 16,000 workers!

On top of this a nuc would also contain about a kg or two of honey plus pollen.

So, in our case a 5 frame nuc will contain:

- 5 made-up frames
- About 16000 bees
- A kg of honey or two
- Some pollen
- A young queen
- A Small Hive Beetle trap
- Some work and wear and tear on the equipment.

The question is:

What's is a 5 frame nuc worth??

For more on the subject go here: <http://www.nzbees.net/threads/how-many-cells.5228/>

SHB – from a US forum – some interesting ideas

This is by far the easiest Beetle Trap you will ever make! It takes 2 min if you go slow.

What you need:

Large container that will fit in your freezer. (I used a one gallon white icing bucket)

1/8 hardware cloth (same size as SBB)

Duct tape

Pieces of honey comb with some honey/pollen/dead brood whatever you got (total of 1/4 pound or less of honey)

Cut your hardware cloth so that it will fit your container. Put your comb in the bucket standing up side by side no bee space. Loosely pack the bucket full with honey comb. Give yourself a little room to move comb to look for beetles. Tape the hardware cloth on the lid to keep bees out. Put it where it will not get filled with rain (or only use it when it not going to rain). You want it in open air. Not in an empty hive. You know it's working if you see a few bees trying to get in. For the first few days bring it in daily and put it in the freezer. I waited until after dark thinking it would catch the most beetle and before raccoons would get it. Once the beetle numbers drop I left it out few days. (eggs hatch in 3-4 days) I did not have problems with raccoons but you might. More testing is need to optimize how long it should be left out at a time and prime beetle catching times.

My results:

Before the trap: hives in full sun: 0-1 beetle in or around the inner cover and very rarely on the comb. Hives in full shade 1-4 in or around outer cover, 1-8 on comb. Beetle have been increasing as fall approaches. (All beetles were killed when found).

First day/evening of trap: without counting > 50 beetles, second day >20, 3rd-5th day around 10 per day, then I started leaving it out for several days at a time and not counting beetles but there were some. If I leave it out too many days it attracts small flies which freeze just that same. No moths were found in the trap but several were killed on the sides of hives.

After first week of trapping: Hives in full sun: no beetles observed. Hives in full shade 0-1 in or around outer cover, 0-4 on comb.

A combination of killing beetles and moths on sight might helped in the beetle number dropping in the hives and explain why no moths were found in the trap. If moths are also your target use slum gum in your trap, Have found that to be very attractive to moths as sun goes down.

I have always thought it would be better to fight the beetles outside the hive, the fewer beetles inside the hive the more pressure the bees can put on each beetle.

What next with Small Hive Beetle?

Varroa is the biggest cures of Beekeepers in most parts of the world.

To reduce or indeed eliminate the impact of Varroa a number of researchers have tried to breed the perfect bee, Bees which are super hygienic and will remove Varroa from other bees. Prof Marla Spivak (Google her name – amazing what she has been doing with bees) and John Harbo came close to breeding the perfect bee. Sadly, after a few years, the hygienic bees became less effective as the Varroa numbers increased. I'm sure that work continues and we will hear more about this.

Phil Chandler, the author of the "Barefoot Beekeeper" and a Preacher in the Church of everything You Know Is Wrong believes that the aim to find the perfect bee is wrong. He thinks that humans can't control nature. He says that the biggest enemy of bees is not Varroa but

industrial agriculture (see National Geographic May 2015)

Indeed the practice to take bees on long trips to pollinate single crops, the destruction of natural vegetation and the increasing use of Pesticides is working against bees and their health and ability to resist pests and diseases. Many agree with him but are vexed when he says that the best thing to do for Varroa isNOTHING.

“Keep bees healthy and well feed, but let evolution work” - he says. “For ten years or more, beekeepers might lose most of their bees”, he concedes But natural selection would eventually lead to some kind of resistant bee. “We have to think of these issues in terms of what is best for bees: he says “Not what is best for us”.

How would his thinking translate to Small Hive Beetles?

I don't have a strong opinion but can pass on our observations by a number of Beekeepers in the valley (Upper Mary Valley)

Doing nothing was not a management option as initially – say 8 to 10 years ago, we all lost too many hives.

Initially the AJ beetle trap with DE was used and did indeed catch a lot of SHB. In more recent years the Beetle Blaster trap again with DE became very popular. The Beetle Blaster Trap is more readily accepted by our bees and is cheaper. If re-used for a number of years the “shoulders” of the trap allow beetles to hide.

At the beginning I saw this as a negative – wanting the SHB In the trap rather than UNDER the trap.



What I and others have observed that such hiding places are guarded by bees – meaning the SHB is trapped and cannot get out. I have lifted traps only to find SHB dead. Not squashed but they simply starved – or so I believe.

Others and I have observed that the propolis groves on inner boards also are used by the beetles to hide and again the bees simply do not let them out.

I believe that bees are “evolving” a habit which is beneficial to them as trapped SHB can’t lay eggs, can’t breed.

While most of the feral hives around us have died out – most likely due to SHB attacks – there is evidence that hives, managed and wild, have survived for many years without any attention.

Natural selection? Survival of the fittest? I don’t know but we are losing fewer and fewer hives due to Slime Out and that can only be a positive.

Bees Use Multiple Cues in Hunt for Pollen:

Bees use a variety of senses and memory of previous experiences when deciding where to forage for pollen, research by the University of Exeter suggests. The researchers believe pollen-collecting bees do not base their foraging decisions on taste alone, but instead make an "overall sensory assessment" of their experience at a particular flower.

Bees typically do not eat pollen when they collect it from flowers, but carry it back to the nest via special "sacs" on their legs or hairs on their body. This makes it difficult to understand how bees judge whether the pollen a flower produces is nutritious enough for their young. Indeed, researchers have been puzzled for a long time as to what exactly bees look for when they collect pollen from flowers.

Co-author Dr Natalie Hempel de Ibarra, expert in insect neuroethology at Exeter's Centre for Research in Animal Behaviour, said: "It seems that bees don't just respond to a single nutritional compound in pollen, such as crude protein content, but to a range of sensory cues in pollen and flowers. "They also form memories for locations and types of flowers that they have visited which affect their foraging decisions. We need more research that considers the behaviour and neurobiology of bees to understand when and why they prefer some plants and some pollen over others. A breakthrough in this area could advance our efforts in both biodiversity conservation and crop production."

The review, published in the journal *Functional Ecology*, examines existing evidence on how bees use their senses, previous experience and - in the case of social bees - feedback from the nest to decide where to gather pollen.

First author Dr Elizabeth Nicholls, a former PhD student at the University of Exeter and now a Postdoctoral Research Fellow at the University of Sussex, said: "Our review is unique in considering pollen foraging from an individual bee's perspective, asking which senses bees use to decide which flowers are worth visiting.

"In our review we suggest that although bees may taste pollen during collection and use this nutritional information to guide their choices, they are also likely to pay attention to the strong odour and visual appearance of both pollen and the flower itself."

"For bees that live together in colonies, information passed on from the other bees in the nest, either via chemical cues or even special 'dances', may also be important in influencing their pollen-collecting behaviour."

The University of Exeter is a major hub for bee and pollination research and currently advertising several postgraduate research projects.
Article from: "The American Bee Journal Extra."

Checker Boarding by B Wrangler:

A swarm is resting on its way to a new home.....

Checker boarding is a simple and elegant swarm management tool. It uses the bee's natural swarm and survival impulses to maximize hive populations and honey production. When checker boarding, empty comb frames are alternated with feed frames in supers directly above the broodnest. Checker boarding:

- increases clustering space
- keeps the brood in direct contact with their food reserves
- opens up a honey bound broodnest
- doesn't chill or disturb brood rearing
- provides additional empty comb storage for early nectar flows
- is empty and ready for mid-summer flows

Implementation and timing isn't critical, when it's done early enough.

The results:

- the swarm impulses is abated
- early season management is greatly reduced
- undisturbed hive populations expand rapidly
- the broodnest isn't honey bound by early nectar flows
- empty comb directly above the broodnest stimulates summer foraging
- and that open comb prevents a nectar bound broodnest

Checker boarding compliments the bee's natural behavior. It's the only swarm prevention technique that doesn't confuse, frustrate, inhibit, diminish or disturb a colony. I've only found one problem with checker boarding. It only works on vertical hives with removable comb. So, it's not an option for a horizontal tbh.

Walt Wrights Manuscript:

Checker boarding isn't my idea. It originated with Walt Wright. For a decade, Walt published articles in the American bee magazines. He focuses on Langstroth beekeeping. And his observations are essential for any vertical hive beekeeper wanting maximum production, with minimum effort.

The easiest way to get this information is from Walt. Those bee magazine articles compiled, are about 60 pages long. It's written by a beekeeper, for beekeepers. It's a great beekeeping deal. You can get a copy by sending Walt \$10. He has a pdf version available on the internet for \$8.

Walt Wright
Box 10
Elkton, TN 38455-0010

WaltWright@hotmail.com

Thanks Walt, for sharing your observations.

The Details:

Here's How

The bee's priorities aren't the beekeepers. A hive, that throws a reproductive swarm and quickly reaches an optimum state for over wintering, won't produce much extra surplus honey.

But when basic seasonal broodnest behavior is understood, bees can be easily managed to prevent swarming and produce an exceptional honey surplus.

When outside resources first become available, frames of capped honey, **in the supers directly above the broodnest**, are alternated with frames of empty comb. A super has a honey frame, empty frame, honey frame, etc.

Additional supers above the first checker boarded box have frames that are alternated in the opposite fashion. That is, an empty frame, honey frame, empty frame, etc.

The objective is:

- to break up the solid band of capped honey directly above the broodnest
- leave the broodnest undisturbed
- keep the cluster in contact with its food supply
- provide additional hive volume

Timing

Checker boarding is done early in the spring before the bees begin rapid broodnest expansion. And it must be done before they make any swarm preparations. After that, it's too late to use checker boarding.

Since the broodnest is not disturbed during the process, it can be done earlier and in cooler weather than most other management practices. In fact, the earlier, the better.

Results

Checker boarding allows rapid broodnest expansion:

- when half the honey is consumed, brood rearing space doubles
- early surplus nectar is moved above the broodnest into empty comb
- nectar isn't packed into the broodnest below a solid honey band
- more comb is open above the broodnest where it's warmer
- broodnest activities and swarming impulses aren't interrupted
- broodnest expansion isn't restricted by a solid wall of capped honey

With checker boarding, the broodnest expands naturally, without disruption, and is large. That extra space prevents congestion. And it takes more nectar to backfill as a hive prepares to swarm. That delays swarming. But the bees surely try to pack it. And they gather much honey in the process. Later, when the bees switch to survival mode, a checker boarded hive has abundant vertical, empty comb space for storing lots of fresh nectar. At white wax, the bees attempt to fill the large empty area above the broodnest. Much to the beekeepers delight.

Limits

In a northern climate, a small colony/nuc builds up faster in a non-checker boarded hive. I live in a cold climate and confining a small cluster, in a smaller hive volume, could have some environmental advantages. Maybe the hive warms up faster or the colony's heat is confined in a more useable space.

My Checker Boarding

Checker boarded hives in early spring.

I over winter my hives in three deeps. In late winter/early spring:

- the broodnest is centered in the middle box
- the top box is full of capped honey
- the bottom box consists of empty frames with pollen and a little honey

When I checker board my hives:

- the middle box with the brood, goes on the bottom board
- the empty frames from the bottom box are alternated with the full frames from the top box
- two checker boarded boxes result
- these two checker boarded boxes are set on top of the brood box

The resulting hive has:

- a box of brood on the bottom
- two boxes of checker boarded frames on top of that

At this time, empty supers could be put on top of the checker boarded hive. That hive would be good to go for the season. But, I wait until dandelion bloom, almost two months later, to add a couple more extra supers. That way, I can work them if needed, without handling empty boxes.

Why It Works – Biology

It's actually harder to understand the bee behavior, upon which checker boarding is based, and write about it, than it is to manage hives using it.

Broodnest Behavior

Two principles control colony behaviour:

- reproductive swarming is the primary focus in early spring
- eventually, a colony shifts activities from swarming to survival

These two principles aren't mutually exclusive. In any given cavity, a colony balances food and brood to safely achieve these objectives with minimum risk. A colony won't risk its survival to swarm.

Broodnest Expansion

In late winter, the bees are directly beneath their food supply. They expand the broodnest by consuming food. That expansion is mostly upward. Food consumption also fuels brood rearing in open comb that is warm enough. Drone comb is eventually exposed. A month after broodnest expansion begins, drones are raised.

Honey Reserves

Somehow the bees monitor honey quantity. And they maintain a reserve amount. Walt found that bees reserve a shallow super's worth. I run deeps and have determined it's about 4 deep frames. That's essentially the same amount and isn't much of a reserve. A large brood rearing colony can consume a deep frame in a day. So, the reserve is a minimal amount, especially when conditions turn bad.

The reserve honey is an emergency food source. When these reserves are tapped, broodnest expansion stops. If the reserves are further depleted, brood rearing stops. Beyond that, brood cannibalism and hive malnutrition rapidly occur. Once a hive dips into its reserves, the colonies maximum seasonal potential is reduced.

Reproduction – Swarm Preparations

The broodnest is backfilled. They have drones and a queen cell. This hive is preparing to swarm. As broodnest expansion reaches its limits, the bees prepare to swarm. They begin backfilling the broodnest with uncapped nectar or diluted honey.

When nectar is available before swarm preparations, top bar hive(tbh) bees build storage comb behind the broodnest and store extra reserves there. But once the bees prepare to swarm, little activity occurs behind the broodnest, even when empty comb and nectar resources are available. Their focus shifts from horizontal to vertical.

If enough fresh nectar isn't available, the bees move resources forward from the honey storage area behind the broodnest. This leaves empty combs toward the hives rear.

Open space and open comb aren't factors in swarm preparation for a tbh. When both conditions exist at the far end of the hive, the bees swarm when the broodnest meets their vertically determined requirements. A tbh beekeeper, unfamiliar with this behavior, is often surprised when hives, with open comb and empty horizontal space, swarm.

Backfilling:

- restricts the queens laying
- provides fuel for the departing swarm
- and reduces the broodnest volume

The fewer bees remaining after the swarm departs, can easily take care of the reduced amount of brood. And the additional open comb is readily available for the next generation of brood.

As a commercial beekeeper, I saw backfilling when no surplus nectar was available. We called it shake. Some beekeepers got excited about it, thinking the bees were finally making

a living. I always wondered where it came from. Hummmm.....

Once backfilling begins, swarm cells are started. If there isn't enough food reserves, or backfill, or time, the colony terminates swarming. Then, they switch to their survival behaviour without negatively impacting the colony's welfare.

After a certain time, all swarming preparations stop. Walt calls this the 'Reproductive Swarm Cut-Off Date'. At that time, a colony not on the verge of swarming, abandons swarming regardless of conditions.

Queen cells left after the swarm cut-off date, are supersedure cells. If a beekeeper cuts these cells and doesn't recognize this behavioural change, a colony that needs a new queen, might not get one.

Colony Survival – Nectar Lull

Once a colony swarms, or abandons swarm preparations, its focus shifts to survival. The next three weeks are geared toward producing a colony with the right demographics. Enough house bees are raised to handle the huge nectar/storage demands required for winter survival. And foraging activities are greatly reduced, even when abundant nectar resource are available. Walt calls this the lull in nectar storage.

In my region, the bees work three alfalfa cuttings. They make a little alfalfa/clover honey during the first cutting.

During the second cutting:

- colonies are strong
- hot days and cool nights, necessary factors for abundant nectar production, exist
- the alfalfa is left to bloom longer than the first cutting, as the farmers are distracted by other crops

But the bees don't make much honey on the second cutting. I would see these conditions and expect a great second cutting honey crop. But I never saw one. Until I understood the nectar lull, I was clue less as to why the second cutting was so unproductive.

Seeing this lull in my tbhs, I worried they would starve before fall. They consumed most of the surplus honey above their reserves to produce more bees. And they didn't get much from the second alfalfa cutting.

White Wax

About three weeks after the reproductive swarm cut-off date, a hive has the right demographics for a main flow. Walt calls this the white wax period. At that time, fresh nectar is stored above the broodnest. And storage cell walls are lengthened in areas of larger cell size comb.

In a tbh, the bees enlarged storage cells near the top bar. These enlarged cells often jut into the adjoining combs space making some combs extra fat and others extra thin. To maintain easy comb access, the bulges must be trimmed off with a serrated knife. The bees don't

build these bulging combs when nectar is available earlier. White wax signals a fundamental shift in bee behaviour.

Tbh bees switch from a horizontal orientation to a vertical one mirroring swarm preparation behaviour. Fresh nectar is stored at the broodnest's top. And all cells, larger than small cell size, are filled and capped. The remaining small cell comb, at the broodnest's core, is filled with nectar. But it isn't capped. If nectar resources fall short, the bees move honey from the tbh's far end and pack the broodnest with it. That often leaves more empty comb at the hive's rear.

Once the broodnest is packed, the bees switch to a horizontal focus. They fill the honey storage area until optimum survival conditions exist. After that, hive activity is greatly reduced. Foraging, even though hive space and nectar resources exist, almost ceases. And they won't take additional feed.

Optimum Survival Condition

Now, the bees are almost ready for winter. Hive activity is at a minimum. And the bees are putting on their winter fat. The cluster size is optimum. There's enough food and it's in the right place. The open broodnest comb, where the bees cluster over the winter, is on the small cell comb near the hive entrance. There, broodnest pests are actively removed, leaving the colony in the best possible health.

B Wranglers's Timing (remember this is for a cold climate in the northern hemisphere)
Here are my timing notes using the terminology from Walt Wrights manuscript. Remember I live in Wyoming:

- I checker board before the end of March
- swarm preparations start the fourth week of May
- my swarm reproductive cut off date occurs during the third week of June
- actual reproductive swarming occurs from the second week in June to the first week in July
- the storage lull occurs from the third week of June until the second week of July
- the white wax period begins during the second week of July

Walt has more to say about nectar management. Checker boarding can be fine tuned to local conditions.

If you try checker boarding expect:

- much stronger hives, much earlier
- with few exceptions, swarming is a thing of the past
- honey production increases
- an easier work load

At least that's been my experience over the last decade.

My experience in SE Queensland:

I have been Checker Boarding for a long time and find this a very useful process with many advantages.

Keeping SHB under control

This is possibly the most important aspect of CB (Checker Boarding) for me. When I move the frames from my 5 frame nuc's into a 10 frame brood box I arrange the frames in the following fashion:

Frame with new foundation on outside – followed by a frame from the nuc box – followed by a frame with new foundation – followed by a frame from the nuc box....you get the idea. At one stage you will have two frames from the brood box together.

The advantage I found is that the bees spread across ALL frames very quickly. This is important as we have just moved the population from a 5 frame nuc to a super with double the space – meaning that the same number of bees need now to protect twice as big a home. There is a risk that SHB population will increase unhindered. Checker Boarding does reduce this risk.



Swarm Prevention

Early spring is the time when I do most of my splits. In my case I take 3 good brood frames and some honey /pollen from a good hive and move these to a 5 frame nuc box. Rather than replacing the missing frames in one block I again CB – e.g. I place a frame with new foundation between old frames. This will give the queen a lot of extra space to lay eggs as soon as the foundation has been drawn by the bees.

Having to draw all these frames and the loss of thousands of bees does reduce honey yield for one to two months but the bonus is that you re-new the brood nest and of course you will have an extra nuc to expand your hive numbers or to sell.

Get the bees to move into a new super

Whenever I make-up a new hive and the brood box is ready to have the honey super added I

move a few frames – 2 to 3 – of mostly capped brood (without the queen!!!) into the new super with new foundation and replace them with frames with new foundation in the brood box – again in CB fashion.

Bees will never abandon their eggs and larva and will move into the honey super without delay. This is also a good way to again give the queen more room to lay eggs and spread the bee population through-out the expanded hive. Very important with SHB around.

Checker Boarding is a useful technique and worth considering as part of your hive management.

Advertising Feature:



Vented Bee Suit: \$140 For the serious beekeeper. The best way to stay cool while working with the bees. Rubberized netting between woven netting allows excellent ventilation even on the hottest days yet will keep you sting free. Generous cut to allow loose fit. With self-supporting, collapsible veil. Quality zips. And elastic at the wrist and waist. **Please note items marked ** IN STOCK. Others available as back order.**

Sizes: Length from shoulder to feet:

XS	66 inches
S	67.50 inches
**M	69 inches
**L	70 inches
**XL	71 inches
**2XL	73 inches
**3XL	76 inches

To place your order email Max at max@ecologicalsolutions.com.au

Interesting facts:

Flowers attract birds and bees to your garden, but some colours are more likely than others to appeal to bees than birds and vice versa. We take a look at your garden through the eyes of these two creatures. **check here:** <http://www.abc.net.au/news/2016-11-16/birds-and-bees-prefer-have-flower-colours-preferences/7959382>

<http://guardian.ng/features/bees-taught-to-pull-string-for-reward-and-then-train-others/>

Begging for Water gets Water collector bees busy:

Thirst is a sensation that we can all relate to: however, dealing with this basic physiological impulse takes on a whole new dimension when an entire bee colony craves water.

“We are interested in the social physiology of honey bee colonies, that is, how they work as physiological units,” says Thomas Seeley, from Cornell University, who was curious how the elderly bees that are tasked with gathering water know when the colony’s collective thirst is running high. “Water collectors do not spend much, if any, time in the broodnest, and yet somehow they know when to start collecting water to control its temperature,” explains Seeley. Intrigued, the scientist and his colleagues Madeleine Ostwald and Michael Smith turned up the heat to make a bee colony thirsty. They discovered that water collector bees begin searching for water when the colony is thirsty in response to insistent begging by nest mates: and when water is available and the colony is hot, water bottle bees store water for later use. The team publishes their findings in *Journal of Experimental Biology*.

Bees use three mechanisms to cool an overheated hive - nest evacuation, fanning with their wings and water evaporation - so Seeley and his colleagues raised the temperature in a glass walled hive by positioning a lamp close to the broodnest to find out how the hive responded. However, the water collectors did not spring into action immediately. It was only when the workers began desperately begging for water - by walking up to the face of another bee, contacting the bee’s antennae with her own and then extending her tongue between the mouthparts of the other bee - that the water collectors increased their water-bearing activity. By begging more, the thirsty nurse bees in the broodnest have prompted water collectors to embark on water-collection flights and the hive managed to stabilise its temperature at around 40C.

The Team then removed the nearby water supply for 2.5 hr to find out how the hive coped, and this time the temperature soared dangerously to almost 44C. “the water collectors continued visiting the empty water source, which they probed feverishly but unsuccessfully,” recalls Seeley. Ostwald and Smith also gauged the colony’s thirst by pipetting a 0.2ml puddle of water onto the floor of the hive, which the bees gulped down in just 46s - in contrast to the well-hydrated cool bees from earlier in the day, which took almost five minutes to drain the puddle. Despite increasing the air flow through the hive by recruiting more fanning bees, and evacuating workers, the thirsty bees were unable to use evaporation to keep the hive cool. However, when the team returned the hive’s water supply 2.5hr later, the water collector’s delivery rate skyrocketed, from 3.2h/30min (when the hive was cool) to 22.8g/30min as the colony satisfied its thirst: which is impressive when each bee can only carry 50mg of water per excursion. Some even performed waggle dances to recruit additional water collectors.

Finally, the team set the bees another challenge when they warmed the hive briefly while providing unrestricted access to water before gathering bees later the same day to analyse their crop contents and the contents of brood cells. “We had to open the hive in the evening and then pluck bees, one by one, off the combs, and squeeze their abdomens so that they would regurgitate their crop contents to get data,” recalls Seeley, who narrowly avoided being stung in the eye by the disturbed insects. However the team’s courage was rewarded when they discovered that the hive was stock-piling water in the brood comb. In addition,

many of the bees had bulging abdomens full of water. “We called them the “water bottle bees”, chuckles Seeley, who is now keen to find out whether water collector bees are also motivated by their own personal thirst.

Reproduced from Bee Culture October 2016

Beekeeping Equipment for sale: Pricelist

We source our wood-ware (supers, frames, lids, bottoms) from a family business in Kingaroy. All wood used is Hoop pine, sourced from plantations near Yarraman. All wood-ware is A grade timber. The smoker we sell is made in Australia from heavy gauge stainless steel. Tools and other equipment we mostly import from the USA. Sadly, few tools (if any) are still made in Australia. The lemongrass oil we sell we buy from a Non-government Organisation in Cambodia. The equipment we sell is the equipment we use. *Please note that prices quoted are for pick-up from our Bee House.*

Assembled Bee Gear for Sale:

For our assembled bee gear, we use A grade hoop pine supers, galvanised nails, *Titebond III* glue, *Resene* professional paint, stainless steel wire, brass eyelets, and thick foundation.

Full Size Supers: painted, glued, assembled:	\$60.00
Half Size Supers: painted, glued, assembled:	\$55.00
Full Size Frames: assembled, wired, with foundation:	\$8.00
Half Size Frames: assembled, wired, with foundation:	Please inquire about price-
Lids: painted and assembled:	\$60.00
Bottom boards: painted and assembled:	\$45.00
Made up Nuc's (Box, Lid, Bottom):	\$110.00

Beekeeping Components:

Please note that models may change.

Supers:



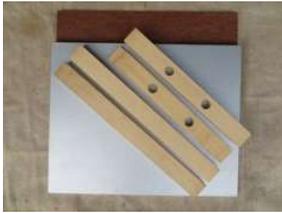
- 10 Frame, full depth A grade \$32.00
- 8 Frame, full depth A grade \$30.00
- 10 Frame, 1/2 depth A grade \$22.00



- Nucleus (5 Frame, complete, A Grade) unassembled hoop pine, includes super, lid and bottom: \$60.00



Bottom Board
(Weathertex, Cypress Pine Cleats, Hoop Pine Risers) \$ 18.00



10 Frame Lids
(Rims, 6 mm Weathertex, Metal Cover, Metal 4 Vents) \$ 26.00



Frames, Full Depth, Hoop pine: each \$ 1.50
Frames, Half Depth, Hoop pine: each \$ 1.30



Thick Foundation, full Depth each \$2.20
13 sheets per kg



Diatomaceous Earth for SHB traps-Small bag \$ 2.00



Beetle Blaster Traps (for SHB) single \$ 2.50

Hive Tools



American Style \$ 8.00



Australian style \$ 17.00



Bee Brush \$ 10.00



Frame Grip \$ 15.00



Emlock Hive fasteners \$ 12.00 (includes metal strap)
 Still the best way to strap a hive together ready for shifting. Works best with Migratory lids.



Frame Perch \$ 15.00
 Excellent when you are doing inspections or splits. The Frame Perch fits perfectly over the hive body and hold up to 4 frames securely. Minimises the likely hood of squashing bees and gives you plenty of room in the hive to manipulate the frames. Made from Stainless Steel.

Bee Suits:



Vented Bee Jacket with veil \$ 110.00 Special!!
 The best way to stay cool while working with the bees. Rubberized netting between woven netting allows excellent ventilation even on the hottest days yet will keep you sting free. Generous cut to allow loose fit. With self-supporting, collapsible veil. Quality zips. And elastic at the wrist and waist.

Sizes: Please note: Sizes marked ** IN STOCK. Others available as back orders.

Size	Waist Size:	Chest round:	Sleeve:
XS	25 inches	51.5 inches	23.5 inches
S	25.5 inches	53 inches	24.5 inches
**M	27 inches	56 inches	24.5 inches
**L	28 inches	58 inches	27.0 inches
XL	29 inches	61 inches	28.5 inches
**2XL	30 inches	63 inches	30.0 inches
3XL	31.5 inches	65 inches	31.5 inches



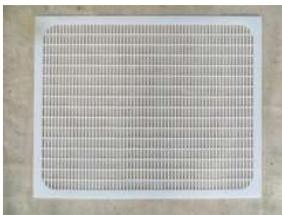
Vented Bee Suit \$ 140.00

As above but full suit. Perfect for the serious bee keeper. **Please note items marked ** IN STOCK. Others available as back order.**

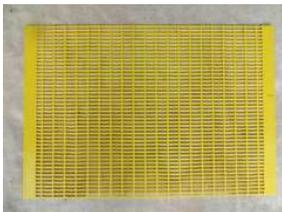
Sizes: Length from shoulder to feet:

XS	66 inches
S	67.50 inches
**M	69 inches
**L	70 inches
**XL	71 inches
**2XL	73 inches
**3XL	76 inches

Accessories:



Queen Excluders, moulded plastic 10 Frame \$ 10.00



Queen Excluders, 8 Frame \$10.00



Metal Queen Excluder: \$20.00



Propolis Trap: \$15.00



**Eyelets (3 mm) Approx 250 \$5.00
Approx 1000 \$ 18.00**



Eyelet Punch \$ 8.00



Stainless Steel Wire 250gm: \$20.00



Frame cleaner \$ 10.00



Capping Scratcher \$10.00



Smoker (made in Australia) \$ 80.00
Smoker (made in China) \$40.00

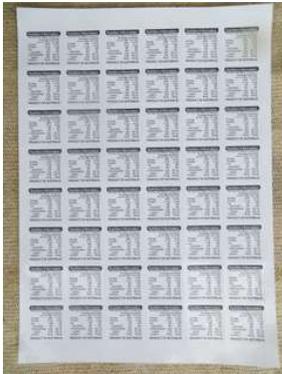


Gloves: \$20.00

Soft leather with ventilated gauntlet. Gives good protection from stings while not interfering with finger movement unduly Nominated Small, Medium or large.



Lemon Grass Oil large \$ 10.00



Nutrition Labels, sheet of 48 \$3.00



US made, Electric Uncapping Knife \$200.00



Frame Wire Crimper \$16.00



Small Embedder \$ 5.00

Medium Embedder: \$15.00

Electric Embedder: \$25.00



Jakel Tool (German) Introductory Price \$40.00 **SPECIAL!**



Refractometer: Aluminium construction: \$60.00



**Honey Filter, stainless steel,
two basket type: \$45.00**



Hive Entrance Closures: \$5.00 large



Entrance Closure: \$10.00
For 10 frame hives. To easily close the entrance to the hive when you have to move it.



Honey Bucket: 20Litre, food grade

\$12.00



Porter gates: Australian made

\$27.50



Bottled Honey: \$11 per kg jar and \$6.50 per 500g jar

We sell our honey from our Beehouse at 59/65 Kilcoy Lane Conondale and at the Witta and Crystal Waters markets. We also sell bulk honey – \$ 8.00 per kg (min orders apply). Our honey is also available at Maleny IGA. The following establishment serves food made with our honey.

www.mantlegroup.com

Bees available spring & early summer from our own splits and queens.
Nuc's 4 or 5 frames **Please inquire**

** Prices subject to change without notice**