

NATURAL BEE HUSBANDRY



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Commercial Warré Beekeeping in Australia

Tim Malfroy

Tim with top bar comb from the first
honey flow in his Warré Apiary, Central
Tablelands, NSW 2010.

In recent years beekeepers have faced tremendous challenges, often experiencing heavy colony losses as a result. These problems are reported by beekeepers, documented widely in the mainstream media and investigated by the scientific community, yet the way in which we keep honeybees is rarely offered as a contributor. In this article I detail my experience with natural beekeeping and the Warré hive and explain why I feel this style of beekeeping is a viable alternative to conventional apiculture, is commercially feasible in some environments and may be a candidate for a healthier way of keeping bees.

Why Natural Beekeeping?

I have had the pleasure of being surrounded by bees my entire life. My father is a well-known professional migratory beekeeper, honey producer (managing 800 organic Langstroth hives) and queen bee breeder with over forty years of professional experience. Despite helping my father for many years, I felt completely unqualified as a beekeeper when he gave me two colonies of bees in 2005.

Part of the reason for this lack of confi-

dence was due to my having witnessed an incredible time of tumult within the local beekeeping industry just prior to receiving the hives. Honey prices were at a record low, American Foulbrood was rampant and Small Hive Beetle had decimated most professional and amateur beekeeping operations in the region where I grew up.

In addition, I was reading stories from overseas about colony collapse disorder, Varroa mite and the impact of systemic pesticides and industrial farming on the bees and the beekeeper's way of life. Young and old were leaving the industry in droves. It was a difficult time to imagine a future in beekeeping.

I was confused as to why bees were struggling when they had thrived naturally for millions of years without the aid of humans. While it was obvious that in many regions of the world humans had created a toxic and barren environment for bees, I thought perhaps it was how we were keeping bees that caused, or at least exacerbated some of the other problems that existed.

I started researching different methods of keeping bees and gradually realised that

the biological 'needs' of the Bee and the 'wants' of the beekeeper were drifting apart. In fact, much of what I had considered to be fairly natural in terms of beekeeping was actually quite unnatural for the bees. Perhaps this rift was due to developments in apiculture since the industrial revolution. Expensive equipment and machinery that increased efficiency and yield often replaced the close interaction between bee and beekeeper. In addition, the cost of this machinery made entering the industry potentially prohibitive to young people.

The rift was also obvious in backyard beekeeping with most beekeepers adopting the methods that large-scale beekeepers used; plastic hives and foundation, regular re-queening, sugar feeding, etc. I could understand industrial beekeepers using these methods to increase efficiency and yield but was baffled that beekeepers with one or two hives would adopt this method (the peak of this anthropocentric approach is typified by the recent 'Flow frame' invention).

Therefore, my goal was to find a style of beekeeping that was simple, cost effective, bee-friendly and suitable for small-scale

beekeeping. I started experimenting with foundationless beekeeping in my Langstroth hives and continued my research, focusing on traditional styles of hives and apiculture that pre-dated the industrial era Langstroth system that dominates Australian apiculture.

Through this research, a whole new world opened up to me. I had found a style of beekeeping that made sense and seemed easier for the beekeeper and healthier for the bees. I continued expanding my beekeeping library, incorporating texts like Eva Crane's *World History of Beekeeping* and *Honey Hunting* and various bee biology books. Those by Thomas Seeley and Jurgen Tautz, whose eloquent descriptions of swarm intelligence and the superorganism concept, harmonised beautifully with the practical aspects of natural beekeeping.

I was attracted to the idea of a commercial beekeeping operation whose philosophy was centered on the understanding of the colony as a superorganism*, respected the natural functioning of the colony, used bee friendly hives, sourced strong local bees and adopted apicentric management.

Why the Warré hive and method?

I was reading a copy of the *Australasian Beekeeper* in 2008 and stumbled upon an article about the Warré hive, written by David Heaf, a beekeeper from Wales. The beehive design, unique management style and philosophy outlined in the article and in Warré's book, "*Beekeeping for All*", described a practical, holistic approach that was also environmentally sustainable and bee friendly.

I immediately started building some hives and in 2009, traveled with my wife to Apimondia in Montpelier, France in the hope of meeting some Warré beekeepers. Fortunately, Nicola Bradbear from Bees for Development organised a session on Warré and top-bar beekeeping during which I liaised with Warré and natural beekeepers from around the world.

On my return, I began preparing my own Warré apiary. I populated the first Warré hive with a large 'shook swarm' and on a late summer honeyflow of Red Stringybark (*Eucalyptus macrorhyncha*) the bees filled an astounding four boxes of comb in a matter of weeks, then wintered beautifully and have continued to thrive ever since. The colony not only built a prodigious amount of comb that season, they also behaved differently, were



Deep hanging comb in a 3-sided frame, Central Tablelands, NSW 2011

far less defensive and had a different aroma, I assume as a result of their being allowed to build virgin comb for the first time. This led me to believe that comb building is an important metabolic process of 'renewal' for the individual bee and the superorganism.

The following season, I conducted further practical trials to test the Warré hive. Seeley and Morse documented the form and structure of a bee nest as it occurs in nature in their paper.** To replicate this nest structure, I shook-swarmed a colony into a two-box Warré hive to mimic the natural size of a bee nest (308 x 308

x 480mm) and left the bees alone for a few months to build their own comb. The result was a classic configuration of a generalised bee nest: oval-shaped brood sitting beneath a wreath of bee bread and thermal dome of honey, cells for 'heater' bees and 'peripheral galleries' on the edges of the comb.

These initial trials indicated that adopting the Warré hive and method supported the superorganism and could pave the way towards building a commercial beekeeping operation that respected the natural functioning of the colony.



Tim checking the progress of the colony by tilting the top box.



Tilt-checking the colony in a Warré hive.



Limekilns Apiary.



A good swarm.

On reflection, some of the positive outcomes of the Warré hive and method were clear to me almost immediately while others took years for me to fully appreciate. I've listed just a few of these below.

Hive design

- The internal box dimension mimics a tree hollow, resulting in the broodnest being located snugly beneath the thermal dome of honey. This means there are no 'dead spaces' as is often the case with Langstroth hives and the colony winters very well (consuming less than half the honey stores compared to my Langstroth hives).
- The cover cloth encourages bees to make propolis and allows the beekeeper to open the hive gently without disturbing the bees.
- The moisture-absorbing, insulating quilt helps the colony stay warm and dry.

Management

- The in-built comb renewal, due to nading, helps with disease control and simplifies management.
- The Nading technique means that the colony can be expanded easily and quickly in spring with minimal effect on the bees.
- Colonies may be inspected using the 'tilt' method, which is both efficient and bee-friendly (limiting the need to do frame by frame inspections).
- The oldest comb is taken during harvest

and not returned to the hive, thereby reducing buildup of disease pathogens and any chemical residues in the comb.

Cost Efficient

- There is a reduction in bee losses (this is the primary expense for commercial beekeepers as it decreases overall yield while increasing labour and other costs).
- The boxes can be built from locally-sourced timber, which reduces the overall cost and carbon footprint of hives. There is only one size box to build.
- Less time is required to manage the hive overall, particularly in spring.
- No storage of 'stickies' is necessary as the entire comb is pressed or strained.

Natural Comb

- Natural comb allows the colony to develop at its own rate. The size of the colony is dictated by the nectar and pollen wealth of the region and strength of the colony, giving a true reflection of the season to the beekeeper.
- Natural comb means colonies are 'drone-right' which is very important for successful mating of queens in local DCA's and for genetic diversity in the bee population.
- Honeycomb can be sold 'as is', without any need for further processing.
- Allowing bees to build their own comb inhibits unnecessary swarming.

Minimal Intervention

– Honeybee colonies are creatures of solitude and benefit from being left alone most of the time***. The opening of hives to inspect colonies is gentle, swift and undertaken during warm, sunny weather. Interestingly, the Warré hive is the only hive I know of that allows beekeepers to check colonies from beneath the cluster and also from above, by removing individual combs.

Our Warré Beekeeping operation in Australia

1. Location.

To be a successful beekeeper you must have a deep knowledge of the local flora and understand how bees respond to the plant species of the area.

I manage over 20 permanent apiary sites and almost 300 hives. Half of these apiaries are situated close to home in the Central Tablelands (230km west of Sydney) with one large apiary on our property. Our other apiaries are located in the Blue Mountains (70 - 100km west of Sydney), the furthest being 150km away. I rarely move hives to new locations, so each apiary site is carefully selected to provide for the needs of the Bee all year round.

The diverse flora of the area is hugely important for the health of my bee colonies. Each bio-region contains dozens of eco-regions, particularly in the Blue Mountains where the flora changes dramatically with altitude and topography (the area rises from sea level to over 1000m altitude in 37km). Situating permanent apiaries within a few different regions gives me more flexibility as a commercial beekeeper as unique varieties of honey may be harvested from each region at different times of the year and it is uncommon for both regions to have unsatisfactory weather conditions for honey production at the same time.

2. Climate.

The climate in Australia is highly variable and often harsh; temperature extremes across our apiaries range from 48°C in the height of summer to -10°C in winter and often fluctuate by 25 degrees or more in a single day. Rainfall is also highly variable in both regions, ranging from 600mm/year in the Central Tablelands to 1500mm/year in the upper Blue Mountains.

We are fortunate to be located in an area with a diverse climate, encompassing sub-tropical and cool temperate zones.



Comb in three-sided frame partially completed.



Detail from completed brood comb.

Coupled with the diverse flora of the area, each season is wildly different and presents both problems and opportunities in regards to bee management.

3. Flora and Honey sources.

The Greater Blue Mountains World Heritage Area incorporates over 1,000,000 hectares of wilderness (a forest larger in size than the island of Crete). The area received world heritage status for its diversity of Eucalypts and refugia of ancient plant communities.

The Eucalypt diversity ranges from the tall open forests of the mountains

and deep valleys to open woodlands and mallee shrublands. These forests together with non-Eucalypt ecosystems including rainforests, heaths and wetlands protect a significant proportion of Australia's total biodiversity (<http://www.bmwhi.org.au/wp/about-us/world-heritage/>). The floral diversity is staggering; there are more than 1500 plant species in the Blue Mountains and in excess of 3000 in the Sydney Basin to the east of the mountains, many of which are highly melliferous.

Honey yields are variable in the Blue Mountains, however surplus honey can be

harvested almost every season. Last year over 100kg of honeycomb was harvested from some of my Warré colonies, a staggering amount of honey considering the bees had to build their comb and swarming was allowed. In the Central Tablelands, dramatic honeyflows are provided by two of the local Eucalypt species, in particular Yellow Box (*Euc. melliodora*) and Red Stringybark (*Euc. macrorhyncha*). Other Eucalypts, Wattles (*Acacia sp.*) and various shrubs and ground flora provide supporting nectar and pollen. Yields are highly variable, as Yellow Box only flowers once every 2-4 years and Red Stringybark once every 4-8 years.

Fortunately, there is no industrialised agriculture practised within bee flight range of any of our apiaries in either region. All honey is produced from woodland or wilderness areas and is, therefore, very pure.

Both regions do have their difficulties, with extreme weather events, particularly heat waves, floods, drought and bush fires, a constant concern. In 2013 I lost a large percentage of my hives in a bushfire that raged through 55,000 hectares of wilderness in just three days.

Locating apiaries in these 'wild' environments has been a conscious decision and has a number of immediate benefits; the bees have access to a wide diversity of high quality natural food (nectar and pollen), colonies are allowed to swarm and take on the genetic resilience of the wild bees of the area, colonies will never come into contact with agricultural chemicals or urban pollutants and the honey is very pure and unique so can be sold at a higher price.

4. Populating hives.

Due to the large expanse of wild areas and abundant forage and habitat (tree hollows) for honeybees, we have been able to increase our colony numbers with naturally occurring swarms.

These swarms are either captured in specially located 'bait hives' or caught as we see them in the apiary. We have also populated many hives using the 'shook swarm' method, sourcing bees from a Langstroth apiary where the beekeeper rarely harvests honey and allows the colonies to swarm regularly.

Bait hives are my preferred method as they have the highest success rate and require little work. The power of natural

swarms is a wonder of nature and is the foundation on which this whole style of beekeeping rests. Tapping into this great source of natural energy has been the most surprising and enlightening part of my beekeeping journey. The experience of watching a swarm enter a bait hive and fill it with new combs in a matter of days can't be replicated in conventional apiculture.

Some years I collect dozens of swarms, other years there are fewer. Despite this, the benefits of catching swarms for the Warré beekeeper are many; they are usually from strong healthy colonies, are disease free, primed to build an enormous amount of fresh comb, are locally adapted and you don't have to pay for them.

Warré Hive modifications for Australia

Partly due to its simplicity, the Warré hive can be modified slightly to accommodate local timber sizes and beekeeping conditions. Some of the things we have changed include:

1. Internal box dimensions: 308 x 308 x 240mm - these are slightly different to Warré's design due to the standard timber sizes in Australia. I use 22mm thick timber, which has been dressed down from 28mm green planks of salvaged macrocarpa cypress.

2. Frame design: beekeeping legislation in Australia requires removable comb. The 3-sided 'open' frames work beautifully and the comb surface area mimics that of Warré's original design.

3. Base: a custom designed bee-friendly base has been developed for areas with high populations of Small Hive Beetle.

4. Entrance Aperture: I use a full width entrance and entrance reducers for smaller colonies and for during the winter months.

5. Additional box size: I use half depth boxes (120mm) quite a lot for producing honeycomb frames during large honeyflows and also for my small 'breeder' colonies ('bee-friendly' supering also prevents honey binding of the broodnest during these intense times of nectar abundance).

6. Quilt: I use a simple calico bag filled with wood shavings for the quilt contents.

In addition, we have extreme weather events and have made modifications for heat waves. The top of the hive is painted white to reflect heat. During heatwaves I place two pieces of 10mm thick timber

across the top of the quilt box to allow hot air to leak out instead of getting trapped. I also pin hessian to the hive to prevent direct sun hitting the hive walls.

Wild Honey and Honeycomb

Small wooden frames, each holding almost 1kg wild honeycomb, are harvested and sold direct to restaurants, cafes and private customers, eliminating the need for any honey processing. It's the highest quality honey sold at the highest price, with no additional work other than harvesting from the hives.

Honeycombs are 100% ripe when harvested. Combs are also selected for cut-comb sections (I cut 200g square sections with a custom-built stainless steel comb cutter) and the rest is scraped into buckets. The comb is shredded with a custom-built stainless steel 'Moulimiel' and the shredded comb is tipped into 4 units of a 3-tier straining system. The shredder is particularly useful for processing the 'post-brood' honeycomb that is harvested from Warré hives. 90% of the honey strains naturally overnight and I'm able to tap off 120 kg of beautiful clean honey the next morning. The remaining wax is pressed for the last of the honey. The wax is then melted, filtered and poured into moulds for 1kg beeswax blocks.

The benefit of this system is that it is efficient, cost effective and yields a higher quality product compared to extracting.

Our entire business has been built on the natural organic qualities of our honey and our sustainable approach to apiculture. For over 10 years I have been attending farmers' markets, giving talks at food industry events and networking with well known chefs in Sydney to raise awareness about the importance of bees and to promote our natural honey and sustainable beekeeping methods.

Fortunately, there is a push these days to not only encourage organic, biodynamic and permaculture food production, but also to connect 'ethical' food producers to chefs and consumers. Being located close to Sydney, producing a high quality natural food in a well-known 'wild' landscape, using Warré hives and bee-friendly methods and working incredibly hard, not only with the bees but also on promoting the fruits of our labour to receptive customers, are some of the factors contributing to our success.

Conclusion

The Warré hive in combination with our customised Warré method has proven itself in a variety of different climates and conditions in Australia and supports not only the bees, but the beekeeper as well. As a result of adopting this bee friendly method, I currently produce tonnes of honey and honeycomb each season and have managed to set up a successful commercial beekeeping operation.

I also teach my customised Warré method for Australian conditions to approximately one hundred and fifty students a year and it is incredibly satisfying to see this style of bee-

keeping practised successfully by women and men, young and old alike. There are now hundreds of new natural beekeepers in Australia, producing their own honey and spreading the word about the importance of bees and the natural world they (and we) rely on.

While I hope that this article provides some inspiration to aspiring professional natural beekeepers, it is worth keeping in mind that the joy of beekeeping, even for most commercial beekeepers, has nothing to do with remuneration. As Warré himself pointed out, "I pity those who keep bees only to earn money. They deprive themselves of a very sweet enjoyment".

*Buzz about Bees :Biology of A Super-organismby Jurgen Tautz and The Super Organism: The Beauty, Strangeness of Insect Societies by Bert Holldobler and E.O. Wilson. "The Nest of the Honeybee".

** The Nest of the Honeybee, by Seeley and Morse.

***My approach to minimal intervention beekeepinghas been influenced by the concept of Nestduftwärmebindung, the principle of the importance of 'Nest Scent and Heat' as outlined in by Johann Thur in his book Beekeeping: Natural, Simple and Successful, a wonderful common sense text that mirrors much of what is written in Beekeeping for All by Abbé Warré.



Malfroy's Gold Products

Books recommended for Apicentric Beekeepers

The Life of the Bee, M. Maeterlinck
The World of the Honeybee, Colin G Butler
The Buzz about Bees, Jürgen Tautz
The Hive: The Story of the Honeybee and Us, Bee Wilson
The Biology of the Honey Bee, Mark L. Winston
Bee Time, Mark L. Winston
Honeybee Democracy, Thomas D. Seeley
Honeybee Ecology, Thomas D. Seeley
The Wisdom of the Hive, Thomas D. Seeley
Following the Wild Bees: The Craft and Science of Bee Hunting, Thomas D. Seeley
The Incomparable Honeybee, Reese Halter
Towards Saving the Honeybee, G. Hauk
Farming for the Landless: New perspectives on the cultivation of our honeybee, Sarah Waring
A Beekeeper's Progress, John Phipps
At the Hive Entrance, H. Storch

Natural Beekeeping: Organic Approaches to Modern Apiculture, Ross Conrad
Beekeeping with a Smile, Fedor Lazutin
Sensitive Beekeeping – Practicing Vulnerability and Nonviolence with your Backyard Beehive, Jack Brette-Mills
From Flower to Jar, M. Weiler
Bee-Friendly Beekeeper, David Heaf
Beekeeping for All, Abb Mile Warr & Abbe Emile Warre
Natural Beekeeping with the Warre Hive, David Heaf
The Tree Beekeeping Field Guide, Jonathan Powell (Kindle)
Top-Bar Beekeeping: Organic Practices for Honeybee Health, Les Crowder and Heather Harrell
A Guide to Natural Beekeeping in Top Bar Hives, Christy Hemenway
Top Bar Hive Beekeeping, W A Mangum
Balanced Beekeeping I: Building a Top Bar Hive, Philip Chandler
Care of Bees in Warré and Top Bar Hives (Without Fuss or Chemicals), Joe Bleasdale
Taming the Mighty Mite, Kefyn M Catley

Plants and Beekeeping, F N Howes
The Bee Garden: How to Create or Adapt a Garden To Attract and Nurture Bees', Maureen Little
Skeps: Their History, Making and Use, F. Alston
The Handy Book of Bees, Pettigrew
Traditional Japanese Beekeeping, Kindle Edition
Bees, Rudolph Steiner

Letters to the Editor

Please send comments and questions regarding apicentric beekeeping to the Editor - editor@naturalbee.buzz
The questions will be answered by our team of experts and appear on the magazine's website: naturalbee.buzz
We are also interested to hear about any meetings and courses that are being organised so that they can be listed on our website.

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