



# The Story of Native bees

Incorporating native bees into a Permaculture garden/farm environment.



# Native bees transferred into a hive



# The benefit of bees in the garden/farm environment

- ▶ - through pollination, fruit size is improved, so is fruit and seed set
- ▶ - fruit and vegetables will benefit
- ▶ - trees, shrubs, herbs, ornamentals all benefit, weeds as well
- ▶ - bees are nature's way of cross pollinating many plants. The wind of course does this too.

# Add native bees to the permaculture operation.

- ▶ Quite often bees are overlooked in a permaculture operation because of the fear people have of the honeybee.
- ▶ There are three main Australian social (lives in colonies) stingless native bees of use to us.
  - ▶ *Tetragonula carbonaria*
  - ▶ -*Tetragonula hockingsi*
  - ▶ -*Austroplebia australis*

Of course there are many solitary bees in Australia (close to 2000 species). These are very specialised in what they feed on and where they live. Many do pollinate crops as well.

Examples of these solitary bees are teddybear bees, carpenter bees, metallic bees, resin bees, reed bees, leaf cutting bees. These however do not collect useful amounts of pollen and nectar.

So the social stingless bee, in addition to the benefit to pollination of crops, they can gather a good amount of honey around 1kg and pollen, which is nothing like that of honeybees who can gather on average 30 kilograms of nectar, more if you extract honey a few times a year.

# Honey

- ▶ While on the subject of honey, I want to make a distinction between nectar and honey.
- ▶ Nectar is a sweet secretion produced by a flower which the bee and many other insects eat, the social bees such as the honeybee and stingless bee also gather this nectar to store in their hive, for a later date.
- ▶ Honey is the nectar turned into honey through having passed through the honey-gut of the bee, which means there are a number of enzymes added.
- ▶ Furthermore the water in the nectar is reduced from about 70% to less than 18% for the honeybee. This prevents spoilage that could happen through fermentation.



► Products that the bees provide us with are many

- - HONEY
- - POLLEN
- - BEESWAX
- - PROPOLIS

# Honey and Pollen

- ▶ The honey of the native bees have a higher moisture content so has a lower viscosity (more runny). This is possible because the chemistry of their honey is different, even though they may feed from the same food sources.
- ▶ Pollen is a very important food source for the bees. It has a high protein content 25% plus. They collect this from the anthers of the flowers, and is stored and used as a food source for the brood and adults.



The brood inside a recently split beehive. *Tetragonula carbonaria*.

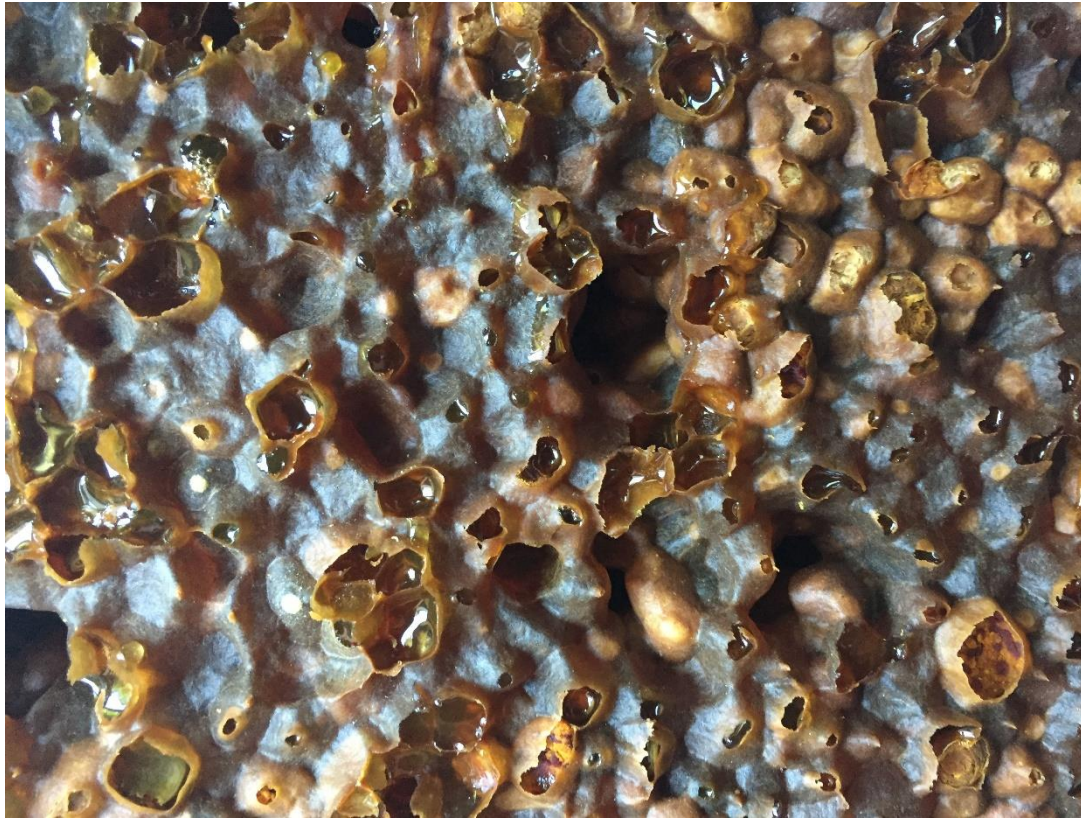




Another shape of the brood structure in  
a *Tetragonula carbonaria* hive.



Honey pots and pollen pots inside a native beehive. About 1 kg/year collected



# Food source for the native bee

- ▶ **A large range of plants produce nectar and pollen for the bees.**
- ▶ Native plants
- ▶ Exotic plants
- ▶ These plants may be forest vegetation, aquatic plants
- ▶ fruit trees, nut trees, shrubs, herbs, vegetables, ornamental plants



# Sunflower



# Flame tree



A nice store of both pollen and honey in  
the native bee hive



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Note pollen pots lower in the photo, advancing brood front in middle. Paler brood cells part of old front. Note queen cell.





# The brood of native bee species- *Tetragonula hockingsi*.





# One of the pests of native bees. The assassin bug





# Pests of native bees

- ▶ Note that most organisms on earth have both pests and diseases they suffer from and there is always competition for food and space (resources) Native bees are no exception. A strong hive means there is no real issues with pests as the guards will prevent entry of the pests.
- ▶ The most important pests of the native bee are the
  - ▶ - SYRPHID FLY (Similar in appearance to the hover fly)
  - ▶ - PHORID FLY ( a very small fly hunchback vinegar fly, very fast moving)
  - ▶ - SMALL HIVE BEETLE
  - ▶ - BEMBIX WASP
  - ▶ - ASSASSIN BUG

A NATIVE BEEHIVE IN NEED OF RESCUE.  
Note all wood has rotted away leaving only resin.





Bees run out of room in the hive so decided to build in the weatherproof cover.





A number of ways of propagating native bees.  
1. Education, 2. Placing a hive on top of a stump/log. 3. Splitting



The entrance to the beehive partially closed with resin, for protection against 1. excessive wind. 2. Against pests. 3. 'takeover'



# Propolis

- ▶ Propolis is a substance the bees gather from vegetation.
- ▶ It is used -
  - ▶ - Against the growth of mould,
  - ▶ - Prevention of pests entering the hive, also used in immobilising pests such as any insect considered a threat to the colony.
  - ▶ - Used as a gap filler, prevent excessive airflow through the hive,
  - ▶ - Prevent light from entering the hive. I have even seen a mummified rhinoceros beetle (encased in resin) in a hive located in a gumtree. They will also use it on you to deter you from interfering with the hive, as well as bite (not sting).



# Honey extraction

- ▶ There is no easy way to get the honey out of a native beehive.
- ▶ If the bees are in a log or tree trunk then one can only have the bees as an agent in pollinating our crops, or just enjoy watching them. You may just want them through your concern for the bee population.
- ▶ To transfer them to a hive (box) allows us to harvest honey and pollen, if the hive is designed well, this can be done without any damage to the hive brood structure and minimise death of bees on recovering this honey.
- ▶ Work is being carried out on finding an easy way to extract honey without sacrificing too many bees, or destroying the purity of the honey.
- ▶ It is definitely worth extracting because of its medicinal qualities and also its special tangy taste, so unique to honey from the native bees.

# Be in control of your own crop pollination by having your own beehive

- ▶ As the honeybee worldwide is suffering from massive decline in population, and will happen here in Australia too. It is just a matter of time, we should consider having our own hive. There are problems in having a honeybee hive, they sting, neighbours may not be happy. They need a fair bit of work, extracting honey, maintain brood, small hive beetle is a problem, so is a range of diseases.
- ▶ Native bees are far more hardy. Easy to keep, you can be in control of the pollination on your own farm, you get to taste the very medicinal honey, have a lot of pollen too. They are a 'therapy' too, try and sit down and watch them and enjoy, as time will pass you by.