

# Apis Mellifera in the Macedon Ranges

*"The bees' quality of life was highest in gardens and biodiverse forests, and lowest in plantations. As the plant biodiversity declines, bees produce less offspring, so that colonies shrink in size."*

*"Only in environments rich in plant species do they find continuously sufficient, balanced and high-quality food and other resources." Kaluza*

*"Leonhardt explains that even small habitat islands with a high diversity of blooming plants in flight distance are sufficient for this effect to be apparent. "It allows them to compensate the negative influence of both pesticides and monocultures"" <https://www.uni-wuerzburg.de/en/news-and-events/news/detail/news/bees-need-it-colorful/>*

## Overview

### Competition

Many insects, mammals and birds feed on the high carbohydrate and protein created by plants that is nectar and pollen. We should keep in mind all these creatures and make the effort to ensure there is sufficient resources for both the indigenous and domestic nectariferous creatures.

### Geography and Climate

The Macedon Ranges covers a wide and varied range of climates due to the extensive forest canopy, geological variations and altitudes. There is no single answer to plant choices, do not limit yourself to an arbitrary set of rules.

### Attractants

Honey bees are attracted by scent, UV light, visible colour, plant structure and cellular structure peculiarities.

The visible light range of Honey bees begins in the yellow range stretching into UV which is why a rule of thumb of blues and purples is valid, however this ignores other attractants that humans cannot discern and honey bees will visit a very wide colour-range of flowers.

Sweet scented flowers is often a good sign of the presence of high quality nectar, this is a hint only though. Roses for example provide abundant pollen for honey bees but no nectar.

Again, do not limit yourself to arbitrary rules, enjoy your garden.

### Macro-Nutritional Requirements of Honey-Bees

- Water
- Carbohydrate (Nectar/(x)tose)

Honey bees utilise nectar for their immediate feed requirements and the creation of honey stores for times of scarcity. Honey is added to stored pollen to make bee bread for the brood and queen.

- Surplus nectar when stored is conditioned by the bees and is dried to 17% water before capping.

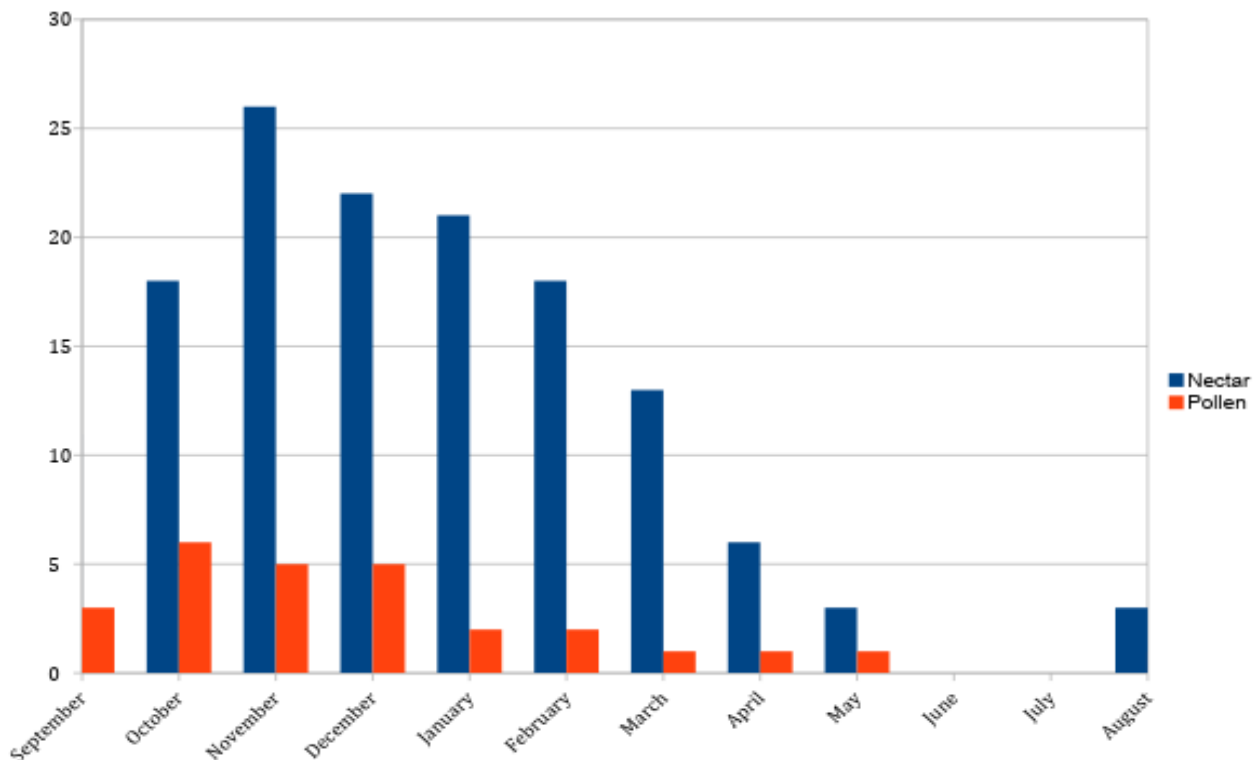
- Protein (Pollen)

Honey bees need a strong source of pollen for healthy brood development and the support of the queen.

- bees do NOT assess the nutrition of a pollen before harvest, they are attracted by shape and scent of the granules.
- Pollen is conditioned by the bees with water, honey and enzymes and acids from their gut flora.
- Surplus pollen is stored for only a couple of months.
- Some floral sources produce more nectar or pollen than others, so a floral source with plenty of nectar or pollen may make up in quantity for any shortage in quality. Sometimes floral sources do NOT provide both pollen AND nectar.
- A honey bee colony can skillfully choose among nectar sources. It will selectively exploit the most profitable source in an array and will rapidly shift its foraging efforts following changes in the array.
- Honey bees have species preferences and even colony preferences
- The widest range of pollen and nectar sources is preferred for maximum colony health.
  - ‘A total of 92 pollen types were identified in the pollen and nectar samples across four different sites, this indicates the diversity of plant species foraged by honey bees and the importance of different species as pollen sources, nectar sources or pollen and nectar sources. At a single site, 76 pollen types were identified and a seasonal variation in the dominance of species was apparent. The diversity of species being foraged reached a maximum during Summer.’

## Seasonal

Based on studies in the United Kingdom relating to bee harvest behaviours it seems that the rates of pollen harvest are concentrated in the Spring period. Nectar peak concentrates in the last Spring/early Summer period. Notwithstanding peak periods a constant availability of nectar and pollen is required all year. (Seasonally adjusted graph below)



## Forage Habits

\*Important to note these are 'habits' or trends NOT rules

- Forage activity is between the temperatures of 10C and 35C
- Daily bee forage peaks at 25-28C. This coincides generally with plant nectaries activity.
- Forage distances fluctuate (season, hive strength, resources and genetics), but the mean distance for honey bees trends to 670m
- There is a preference for large bodies of and running water in bee forage habits.

## What can you do?

- Allow plants to flower abundantly, deadhead if possible.
- Include a large variety (15-20 species) of plants that flower in the periods that match peak forage seasons.
- Water your plants (nectar and pollen creation reduces when plants are under stress)
- Forms of flowers (single, double, lipped, tubular) affect the availability of forage for honey bees.

# Trees And Other Plants For Honey And Pollen In Our Area

## Native Forests

Natural forests around the Macedon Ranges are generally not great for bees. Our forests have largely:

- candlebark (*E.rubida*),
- peppermints (broadleaf *E.dives* and narrow-leaved *E.radiata*).
- Hardenbergia
- Clematis aristata

In the higher rainfall areas like the Wombat forest and in the Cobaws there is a fair bit of messmate (*E.obliqua*).

None of these are great honey prospects except the messmate which does yield well in an irregular manner perhaps every 4 or 5 years. The honey is distinctive and highly valued by those that like it.

There are some pockets of manner gum (*E. viminalis*) and snow gum (*E.paucifolia*).

GOOD Native HONEY TREES ARE A BIT NORTH OF THE MACEDON REGION:

- yellow box (*E.melliodora*) and
- grey box (*E.microcarpa*).

These are in Heathcote, Toorborac, Castlemaine, Metcalf, Taradale areas. The river red gum (*E.camaldulensis*) towards the Murray or Iron barks (*E. sideroxylon* – that's its old name!) and red stringybark (*E. macrorhyncha*) growing in the 'box-ironbark' regions along with yellow box and grey box.

## Gardens

In our region there are copious quantities of introduced eucalypts, usually in gardens and plantations etc. Most gardens have the following plants in close proximity which are excellent bee forage:

- sugar gums (*E. gladocalyx*),
- yellow gums (*E. leucoxydon*) especially the rosea variety, not common in nature but popular.
- Swamp gums (*E. ovata*) not much use.
- Wattles (*Acacias* spp.) are not generally good value for honey-bees, pollen may be useful.

ALSO

- Grevilleas
- Callistemons
- Banksias
- Hakeas,
- Lavenders,
- Rosemary,
- Buddleia, can act as an environmental weed in damp sclerophyll forest, disturbed areas, roadsides and river beds.
- Salvia
- Fruit trees by themselves don't yield lots of nectar though they can provide useful pollen
- Bees go for pumpkins, zucchini, beans, peas and brassicas

## Weeds

Though not to be encouraged many weeds provide excellent forage in close proximity to you.

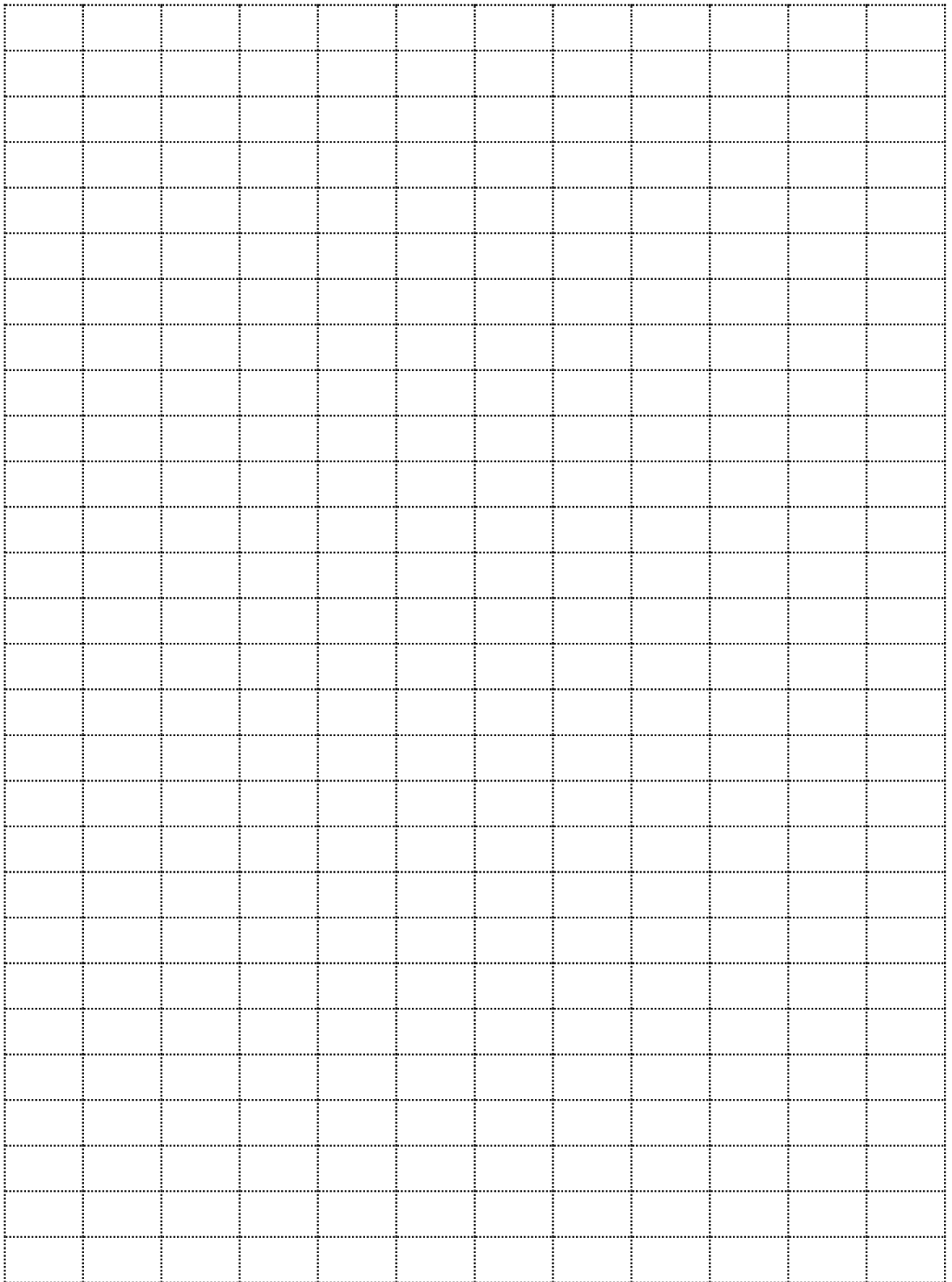
- Dandelion
- Blackberry
- Dog Roses
- Willow
- Hawthorn
- Ivy







NOTES:





## Resources and References

- With thanks to Sara Gormley-O'Brien, Sally Scopel and Clare Claydon
- Plants for Bees, Kirk and Howes
- <https://www.honeybee.com.au/>
- TREES AND OTHER PLANTS FOR HONEY AND POLLEN IN OUR AREA (Prepared by Jim Sansom. [james.sansom@bigpond.com](mailto:james.sansom@bigpond.com) )
- Social bees are fitter in more biodiverse environments, Benjamin F. Kaluza, Helen M. Wallace, Tim A. Heard, Vanessa Minden, Alexandra Klein, Sara D. Leonhardt, DOI: 10.1038/s41598-018-30126-0
- Doug Purdy's book on planting for bees. It is Sydney based but worthwhile.
- Bee Friendly A planting guide for European honeybees and Australian native pollinators by Mark Leech <https://www.agrifutures.com.au/wp-content/uploads/publications/12-014.pdf>
- *Environmental Weeds: a Field Guide for SE Australia*, K Blood (2001).
- <https://www.1millionwomen.com.au/blog/top-ten-flowers-attract-native-bees/>
- Native Plant Nurseries.
  - A & B Trees – Heathcote,
  - Newstead Natives – Newstead,
  - Goldfields Revegetation – Bendigo, <http://www.goldfieldsrevegetation.com.au/>
  - Neangar nursery – Eaglehawk,
  - Western Plains nursery – Bulla

BEWARE: The red box! (E.polyanthemos) An attractive tree to look at but the honey is to be AVOIDED! It tastes like tallow and can taint the rest of your crop! It has bluish-grey roundish leaves, has an irregular shape and tends to grow on slightly drier rocky prominences.