



# Honey flavour profiles

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# Forward

A review of the marketing messages communicated with honey customers by the Western Australian industry showed that they used four narratives: Flavour, Terroir, Health and Production. Whilst the CRC for Honey Bee Products had been addressing systems and tools to support the marketing of Terroir, Health and Production, Flavour had not been addressed. This was further highlighted with a continuation of the international marketing research in partnership with the Department of Primary Industries and Regional Development (DPIRD). Of particular importance was the messaging of a common descriptors for the most popular monoflorals so that the range of flavours was appreciated and sought.

This first report is aimed to guide the WA honey bee industry in the use of common descriptors of their iconic monofloral honeys.

Dr Liz Barbour

CEO

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# Introduction

The honeybee industry in Western Australia (WA) currently directly contributes approximately AU\$50 million through sales of honey, wax and pollen products, while it is also estimated to indirectly contribute over \$AU1.1 billion through pollination services (Karasinki, 2018; Jose, 2022). As of 2021, bulk honey farm gate pricing was reported to be \$6.50/kg, representing the majority of commercial production in Western Australia (Clarke & Le Feuvre, 2021).

WA boasts a wide range of nectar-producing native floral sources which are utilised by commercial migratory beekeepers, many of which are unique and endemic, each with their own distinctive aroma and flavour attributes (Benecke, 2007; Leech, 2012). Quality assurance through testing for medical properties and phenolic profiling has been developed, leading to higher prices for honeys such as Marri and Jarrah (DPIRD, 2018). Yet no marketing strategy has been developed that speaks directly to the visceral sensory experience of the consumer in reference to WA honey. Additional value is known to be created in the wine industry through the association of distinctive aroma and flavour attributes with notions of terroir and storytelling (Beverland, 2005). There exists an opportunity to differentiate WA honeys according to their floral source for the purposes of marketing and consumer education, to generate greater value.

The aim of this project was to generate a list of generic attributes to describe the flavour and aroma profiles of some of the most significant honeys produced in WA. There has been very little work conducted in Western Australia to classify honey flavour profiles to date. As such, it is necessary to draw upon experts from other industries with expertise in tasting and flavour assessment of honeys. Three coffee and wine industry experts (one also with honey expertise) were called upon for this.

- ❖ Lou Chalmer is a sommelier, winemaker and consultant with 19 years' experience in the wine, coffee and honey industries.
- ❖ William Roser is a sommelier, wine show judge, consultant and hospitality professional with over 20 years' experience.
- ❖ Gabriel Tan is a coffee Q grader and winemaker, with 13 years in the specialty coffee industry, including four years international coffee judging experience.



Figure 1: The sommeliers from the left and sitting down: Gabriel Tan, Lou Chalmer and William Roser. Standing behind is Dr Kim Feddema, Dr Liz Barbour and Professor Sharon Purchase



Figure 2: The mixing of each of the honeys in distilled water prior to tasting

## Methods

Samples: 23 monofloral honey samples were collected by the Bee Industry Council of Western Australia (BICWA) from a range of beekeepers across the state. All honey samples were labelled according to variety, place of origin and/or producer. Where possible, multiple samples of the same honey variety from different regions, sites and/or beekeeper were obtained, to provide a more robust dataset and eliminate outlier effects from minor variations in honey flavours and aromas due to variables such as site, season, beekeeper, and so forth. The table below shows a breakdown of the honeys sampled, with producer names withheld for privacy.

Honey Number	Honey Type	Site location
1	Peppermint ( <i>Agonis flexuosa</i> )	N/A
2	Wandoo ( <i>Eucalyptus wandoo</i> )	N/A
3	Wandoo ( <i>Eucalyptus wandoo</i> )	N/A
4	Wandoo ( <i>Eucalyptus wandoo</i> )	Brookton
5	Wandoo ( <i>Eucalyptus wandoo</i> )	Brookton
6	Karri ( <i>Eucalyptus diversicolor</i> )	N/A
7	Karri ( <i>Eucalyptus diversicolor</i> )	Northcliffe
8	Karri ( <i>Eucalyptus diversicolor</i> )	Northcliffe
9	Karri ( <i>Eucalyptus diversicolor</i> )	N/A
10	Yate ( <i>Eucalyptus occidentalis</i> )	Needilup
11	Powderbark ( <i>Eucalyptus accedens</i> )	N/A
12	Marri ( <i>Corymbia calophylla</i> )	Mundaring
13	Marri ( <i>Corymbia calophylla</i> )	Chidlow
14	Marri ( <i>Corymbia calophylla</i> )	Dandargan
15	Parrotbush ( <i>Banksia sessilis</i> )	N/A
16	Parrotbush ( <i>Banksia sessilis</i> )	N/A
17	Jarrah ( <i>Eucalyptus marginata</i> )	Talla
18	Jarrah ( <i>Eucalyptus marginata</i> )	Mundaring
19	Jarrah ( <i>Eucalyptus marginata</i> )	Mundaring
20	Jarrah ( <i>Eucalyptus marginata</i> )	N/A
21	Red Bell ( <i>Calothamnus</i> species)	N/A
22	Red Bell ( <i>Calothamnus</i> species)	N/A
23	Red Bell ( <i>Calothamnus</i> species)	N/A

Table 1. Honeys samples collected for tasting, coded by number and site, where applicable.

Process: Tasters assembled in a conference room early in the morning on the 2<sup>nd</sup> May 2022 to begin the tasting process. A short coffee break was taken in the morning and a lunch break around halfway through the tasting process. All honeys were diluted with neutral tasting (distilled) water at a ratio of 1:5 honey to water, to moderate the intensity of the honeys and allow the judges to spit as they tasted in order to counteract possible palate fatigue. Palate fatigue is common with the consumption of sugar in high concentrations.

Prior to tasting each was stirred to ensure that they were completely dissolved. Stemless Riedel glassware was used and rinsed between tastings with neutral (distilled water) to prevent cross-contamination between samples. The same glass style was used for tasting of all the samples.

The samples were organised by estimated palate weight and intensity, going from lightest to heaviest, by Lou Chalmer. Again, this was done to counteract effects associated with palate fatigue. Honeys from the same tree species were tasted together as a flight. Each variety was also smelt and tasted in its undiluted form off a spoon or pop stick, to pick up on flavours and nuances that may have been less obvious in the watered-down versions, prior to tasting the honey and water solution.

Each taster put forward aroma and flavour notes, all of which were recorded, throughout tasting of each sample. A general consensus was reached for key parameters of body, sweetness and acidity for each honey sample. At the end of each flight, tasters again discussed and reached a consensus for the main descriptors and parameters for each honey type, based on the notes from each individual honey in the bracket, as well as producing an overall summary of the honey type.

## Results

Nine different types of honey were sampled in total. Multiple samples were provided for six of these. The collated results from tastings were recorded (Table 2), and those where only one sample are marked with an asterisk. Two samples were provided of Parrotbush honey, yet it was felt there was too much variability in the samples to accurately collate the results, though some of the key parameters have been included in the results, as they were consistent across both samples.

Honey variety	Aroma	Body	Sweetness	Acidity	Flavours	Overall impression
<i>Peppermint*</i>	Orange, lavender, pear skin, ripe pear	Medium	Medium+	Medium-	Williams pear, chamomile, white flowers, mint, sourdough	A light to medium-bodied and intensity honey with flavours of pear, chamomile and a minty aftertaste.
<i>Wandoo</i>	Grassy, raisin, vanilla, five spice, caramel	Medium-	Medium	Medium	Lactic, brulee, dried mango, papaya, vanilla, five spice, raisin	Well balanced between acid and sugar, clean finish.
<i>Karri</i>	Orange blossom, brioche	Medium	Medium+	Medium+	Butterscotch, nashi pear, mandarin, star fruit	Medium bodied honey with delicate aromatics with acid on the orange citrus spectrum.
<i>Yate*</i>	Banana, vanilla, oyster shell	Medium	Medium-	Medium-	Dried banana, salty, oyster shell, tarragon, lemon, sage, vanilla, red apple, dried pineapple, nougat	A more herbal and savoury honey with a clean and fresh acid.
<i>Powderbark*</i>	Brioche, papaya	Medium	Medium+	Medium	Dried papaya, dried fig, madeira, dried apricot, thyme, caramelised soy, dried peach	A medium bodied, approachable honey. Sweetness is prominent.

<i>Marri</i>	Leather, lemon myrtle, lavender	Medium+	Medium+	High	Red apple, powdery acid, lavender, leather, mango, custard apple	Medium to heavy bodied honey with high sugar, pronounced acid, leather and lavender notes.
<i>Parrotbush</i>	Miso	Medium+	Medium+	Medium+		Difficult to summarise flavours or honey generally, two very different samples.
<i>Jarrah</i>	Green tea, leather, caramel	Medium+	High	High	Dried fig, chocolate, green tea, leather, vanilla, lemon citrus	Medium to full bodied honey with high sweetness and high acid, densely flavoured and savoury.
<i>Red Bell</i>	Umami	Medium+	Medium+	Medium+	Medjool date, hoisin, palm sugar, kaffir lime, green papaya	Medium to full-bodied, umami-laden honey with savoury Asian flavours.

*Table 2. Summarised results from each honey flight with body, sweetness and acidity as key parameters. Aroma and flavour descriptors and overall impressions denoted by descriptors. Single-sample honeys are denoted by an asterisk.*

## Discussion and Recommendations

Overall, it was felt that there was a high level of consistency amongst honeys where multiple samples were provided, allowing for a high level of confidence in the results. The honey that led to the greatest uncertainty in summarising was Parrotbush, which displayed highly variable aroma and flavour attributes across the two samples provided. Additionally, it was difficult to ascertain the accuracy of the notes for Peppermint, Yate and Powderbark, as there was only one sample of each provided. There was also some inconsistency observed in the third Red Bell sample that was tasted, but a high degree of consistency was observed between the other two samples.

Should the honey industry wish to further pursue honey flavour profiling for marketing and differentiation purposes, it is recommended that a greater number of samples of each honey be tasted to ensure accuracy and

consistency. There may also be potential to investigate differences between sites, year and production practices between individual honeys that come from the same floral source, given some of the minor variations between honeys that were otherwise very similar.

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