

# Mānuka Honey

## Overview

Mānuka (*Leptospermum scoparium*), commonly called teatree, is native to New Zealand and southeast Australia.

Mānuka is a fast-growing tree with small scented leaves & single white flowers. It also tends to produce flowers biennially. It can reach a height of 2m in 5 years and has a maximum height of around 4 metres.

This species is often confused with the closely related species kānuka. The easiest way to tell the difference between the two species in the field is to feel their foliage: mānuka leaves are prickly, while kānuka leaves are soft.

Early settlers in New Zealand cleared their land of mānuka as they considered it an invasive shrub. Today, these plants are an important tool for re-vegetating bare, eroded slopes.

## Distribution

Mānuka is common throughout the North, South and Stewart Islands. It occupies a wide range of habitats including hillsides, wetlands and river beds and can be found from the lowlands to low alpine regions up to 1800 metres above sea level.

Mature mānuka is very tolerant of drought, waterlogging, strong winds and frost. It is hardier than kānuka, tolerating less fertile and more acidic soils.

Mānuka and kānuka coverage in NZ is approximately 1,186,103 ha or 4.4%.



## Overview

Mānuka honey did not exist before European settlers brought honey bees to New Zealand in 1839. But today, the product is in high demand.

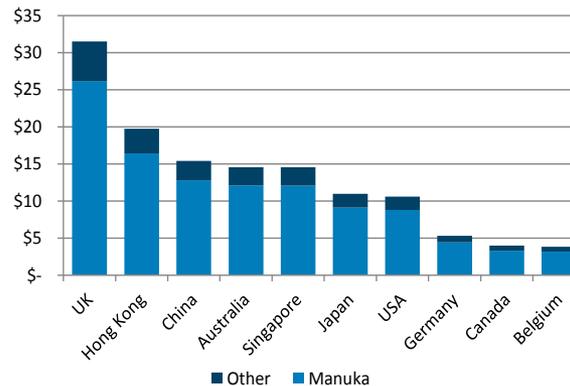
New Zealand's honey exports are growing fast. Exports have grown at a 30% compound rate for the past decade, reaching \$145m in 2013. Much of the increase in honey exports is due to the growing demand for mānuka honey.

The honey industry has grown significantly over the past decade. New Zealand produced nearly 18,000 tonnes of honey in the 2012/2013 season. The success of mānuka honey in overseas markets is driving the growth of the total New Zealand honey industry. New Zealand's mānuka honey receives a significant premium over other suppliers on the world market.

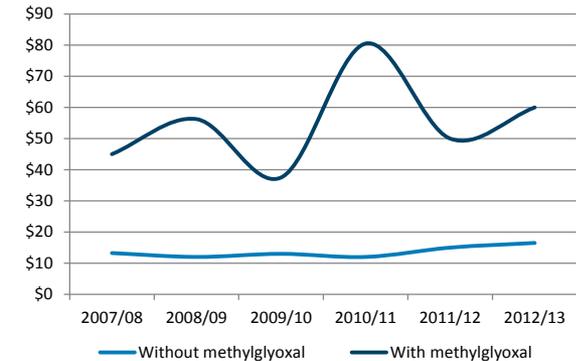
The largest markets for NZ honey the UK and China (including Hong Kong). Prices in the UK can retail at up to \$280 per kg.

In the past decade the NZ honey industry has developed rapidly. It has moved from an industry focused on production for domestic consumption to a high value export sector. The industry is now increasingly science based, focused on biotech and pharmaceutical innovation.

## New Zealand Honey Exports



## New Zealand Mānuka Honey Prices



## Pricing

- The 2012/13 season saw an increase in prices for mānuka honey. Although the mānuka crop was up on last year, it was not a bumper crop.
- Honey prices increased throughout the season due to very low inventory stocks in New Zealand and increased export demand for mānuka, especially from China.
- Mānuka honey is often blended with dark rewarewa honey. As rewarewa honey was scarce during the season, this helped increase offers for other darker bush blends.
- Offers at the beginning of the season for bulk mānuka honey with no methylglyoxal were \$10 to \$12 per kg but later rose to \$13 to \$16.50 per kg.
- The bulk price for mānuka honey with methylglyoxal ranged from \$13 per kilogram to \$60 per kilogram, depending on methylglyoxal levels. Prices for manuka honey with lower methylglyoxal levels rose later in the season to \$18 to \$22 per kg.
- Due to tight supply, many exporters and honey packers were paying cash for some or all of their orders. This helped producers with cash flow during the season.

## Making honey

- A normal beehive produces 35 kilograms of mānuka honey during the season.
- 95% of bees will forage within 6km of their hive. If stressed, they can extend this to 10 km.
- Bees collect nectar from any plant source. To increase the purity of mānuka honey, hives need to be placed with large monospecific stands of mānuka.
- Bees will only collect nectar when weather conditions are good. There has to be little to no wind, no rain and temperatures above 12°C before bees will venture from the hive.
- This means certain areas of New Zealand are better yielding than others. The best yielding areas for mānuka honey are East Cape, Northland and central North Island.
- Ideally 1 hive is needed per 2 hectares of mānuka plantation.



## Highest Yielding Areas for Mānuka Honey



## Number of Hives

Area	Number of Hives
Northland/ Auckland/ Hauraki Plains	62,934
Waikato/ King Country/ Taupo	62,085
Coromandel/ Bay of Plenty/ Rotorua/ Poverty Bay	83,761
Manawatu/ Taranaki/ Hawke's Bay/ Wairapa/ Wellington	103,405
Marlborough/ Nelson/ West Coast	32,596
Canterbury/ Kaikoura	58,035
Otago/ Southland	49,209

Sources: MPI, Peter Molan

**Most types of honey have some antibacterial activity, which is related to the level of hydrogen peroxide it naturally contains**

## Antibacterial activity of mānuka honey

- The antibacterial activity of mānuka honey is different to the peroxide action of other types of honey.
- Only New Zealand mānuka plants contain significant amounts of the chemical methylglyoxal (MGO). This leads to a different way of killing bacteria. It is commonly referred to as the 'non-peroxide activity' of the honey.
- MGO forms by a chemical reaction that occurs after the bees have processed the nectar into honey. It is made from a component of the nectar called dihydroxyacetone, a sugar with no antibacterial activity.
- There is strong scientific evidence that mānuka honey is effective at killing certain types of bacteria. It has been widely used in medical applications as a topical wound dressing for this reason. However, further research is still required on the medicinal properties of mānuka honey.



## Variation in MGO levels

- Levels of MGO in mānuka honey vary. This is primarily due to the proportion of mānuka nectar in the honey.
- The level of MGO in the mānuka component will also be variable. Dihydroxyacetone occurs in varying quantities in different varieties of mānuka plants, which results in varying levels of MGO in the honey. Some mānuka honey may have no non-peroxide activity at all.
- MGO levels will also depend on how long and at what temperature the honey has been stored. At 37°C the activity of the honey will double in 10 weeks.

## Measuring antibacterial activity

- The antibacterial activity of mānuka honey is due to synergy between MGO and other chemicals in the honey. Therefore, increased levels of MGO alone do not necessarily increase the antibacterial properties of the honey.
- The antibacterial activity of mānuka honey is measured in comparison with a standard antiseptic, phenol. A rating of 15 means that the honey has antibacterial action equivalent to a 15% concentration of phenol.

## Overview

Over the past 10 years, the honey industry has faced significant challenges from bee diseases.

With demand for mānuka honey outstripping supply, a decline in the bee population could be problematic.

## American Foulbrood

The most serious disease of honeybees in New Zealand is American foulbrood (AFB), which is caused by a bacterium. This disease is extremely contagious and deadly. It affects only the larvae and when hives are infected it gives off a characteristic smell.

AFB was accidentally introduced with the first bee imports in the late 19th century. Legislation in the early 20th century set up measures to control AFB and helped keep commercial beekeeping economically worthwhile.

## Varroa

In 2000 the parasitic varroa bee mite (*Varroa destructor*) was found in New Zealand. It has become established in the North Island and has also been detected in some northern South Island hives.

The mite appears as a red or brown spot on the bee's thorax, or on a larva. It enters a hive on an adult bee, then crawls into a brood cell, where it lays its eggs which hatch and parasitises the bee larva. When the adult bee emerges from the cell it also carries the mite.

Varroa mites are usually not a problem in a healthy hive. But in autumn and winter when the bee population drops, the mites can overtake a hive and destroy it. Between 2000 and 2005, more than 25,000 hives were lost in the North Island.

The spread and impact of the mite can be minimised by isolating affected hives.

## Other threats

Other diseases that are a threat to the beekeeping industry, but are not currently in New Zealand are:

- European foulbrood (*Melissococcus pluton*)
- Asian bee mite (*Tropilaelaps clareae*)
- bee louse (*Braula coeca*)
- Africanised bees (*Apis mellifera scutellata*), which introduce aggressive behaviour.

Wasps can also be a problem in large numbers, as they can destroy hives.

In March 2007 a new disease known as deformed wing virus was found in Northland. This has been linked to the varroa mite and could seriously affect the bee industry.

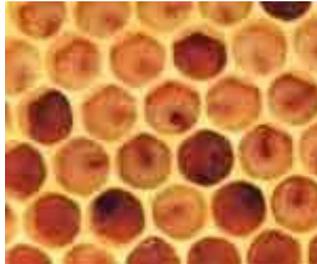
American Foulbrood



Varroa bee mite



European Foulbrood



Bee Louse



Asian bee mite



Sources: MPI, [www.stanford.edu](http://www.stanford.edu)

## Rating systems

There are two rating systems for mānuka honey: Unique Mānuka Factor (UMF®) and MGO™.

The terms “active” or “bioactive” may also be used. This means that the honey has some sort of peroxide activity, as all honey does.

## MGO™

MGO ratings refer to the level of methylglyoxal in the honey, which is unique to mānuka honey. This chemical contributes to the antibacterial activity of the honey.

MGO™ is a trademark of Mānuka Health New Zealand Ltd, and is only used on their products.

## UMF®

Unique Mānuka Factor (UMF®) is an internationally registered trademark that can be used only by licensed users.

The Honey is independently tested in an accredited laboratory for its UMF® rating. They test the antibacterial activity of a honey and compare it to varying concentrations of a standard antiseptic (phenol).

MGO contributes to the UMF of a honey, but the synergy between MGO and other compounds accounts for half or more of the UMF activity.

Mānuka honey with a UMF of 12 – 15 is effective against a wide range of bacteria.



**UNIQUE MANUKA FACTOR®**  
HONEY ASSOCIATION



Licence #	Company	Website
1001	SummerGlow Apiaries Limited	www.manukahoney.co.nz
1003	Arataki Honey Limited (Rotorua)	www.aratakihoneyrotorua.co.nz
1004	Arataki Honey Limited (Hawkes Bay)	www.aratakihoneyhb.co.nz
1014	Waitemata Honey Co Limited	www.waitematahoney.co.nz
1015	Haines Apiaries 2007 Limited	-
1019	Comvita New Zealand Limited	www.comvita.com
1021	Mossops Honey New Zealand	www.mossopshoney.co.nz
1024	Natural Solutions Limited	-
1025	Katikati Honey & Bee Centre Limited	-
1026	Beesonline Limited	www.beesonline.co.nz
1027	Cambridge Bee Products Limited	www.haddrells.co.nz
1032	The Honey Collection Limited	www.honeycollection.co.nz
1033	Cammell's Honey Limited	www.cammellshoney.co.nz
1037	100% Pure New Zealand Honey Limited	www.purenewzealandhoney.com
1038	Golden Flow Apiaries Limited	-
1040	Bees Inn Apiaries	-
1042	M5 Holdings trading as Whakaari International	www.orahoney.co.nz
1043	Honey New Zealand (International) Ltd	www.honeynz.co.nz
1045	NZ Health Naturally Ltd	www.nzhealthnaturally.com
1051	New Zealand Honey Producers Co- operative	www.nzhoney.co.nz
1052	ApiHealth NZ Ltd	www.apihealth.com
1053	New Zealand Health foods Ltd	www.nzhealthfood.com
1055	Red Seal Natural Health Ltd	www.redseal.co.nz
1060	New Zealand Mānuka Ltd	www.nzmanukadirect.com

Licence #	Company	Website
1068	Homecare Health Management Ltd	www.beessence.co.nz
1069	Pure New Zealand Products Ltd	www.purenewzealandproducts.com
1072	Vitaco Health NZ Ltd	www.vitaco.co.nz
1075	Savage Horticulture Ltd	www.wildcapehoney.co.nz
1088	Honey Forrest NZ Ltd	www.honeyforrest.co.nz
1091	Oceania Food Company Ltd	-
1094	NZ Focus NZ Ltd	www.nzfocus.com
1096	Numerou New Zealand Company Ltd	-
1098	Taku Honey	-
1099	Carina Brands International (NZ)	www.carinabrands.com
2010	Streamland Biological Technology Ltd	-
2015	The Manuka Honey Company Pty Ltd	melora.co.nz
2017	Iuvenum & Forma Ltd	-
2020	GO Healthy New Zealand Ltd	www.gohealthynz.co.nz
2024	Happy Valley Honey Ltd	www.happyvalley.co.nz
2031	Mānuka Bioactives Ltd	-
2033	Aulando NZ Ltd	-
2035	Tahi Estate Ltd	www.tahihoney.co.nz
2037	King Honey Health Products Ltd	-
2041	Icing International Ltd	-
2043	North Valley Natural Health NZ Ltd	-
2052	Oravida NZ Ltd	www.oravida.com
2056	Vitamore Ltd	vitamore.com.au

Sources: UMF Honey Association



## Labelling

Different companies have made a variety of claims on mānuka honey labels.

The most common claims are about the activity level of the honey. This could refer to the peroxide activity of the honey, the non-peroxide activity, or the total activity.

Some products also make claims about the level of MGO in the honey. This has the potential to confuse customers.

It can be difficult for consumers to understand the precise meaning of these labels, especially when generic words such as 'active' or 'bioactive' are used.

Part of the issue around labelling is that there is not clear agreement within the mānuka honey industry about which of these terms and claims are appropriate.

## Food Fraud

New Zealand has built a reputation for producing high quality and safe food that can be trusted. Part of this trust has been due to the integrity of our products and accurate labelling.

Recently several markets have tested mānuka honey and found that not all products were true to their labels. Some would not meet the authenticity expectations of a reasonable consumer.

Because New Zealand mānuka honey commands prices 10 to 20 times higher than other types of honey, it is not surprising that it is often subject to fraudulent activity such as mislabelling or adulterating.

According to Oritain, honey is one of the most targeted foods for adulteration and counterfeiting. Oritain is developing an extensive database of authentic honey samples from around the world. It can now compare any sample to its data set and determine if its origin is within a region they have sampled. They can also determine the floral type such as mānuka, thyme, or clover.

This technology may become invaluable if honey from other countries is allowed into New Zealand.

## Development of Regulations

There are two widely used methods for defining mānuka honey in New Zealand: by pollen count and by MGO content. There is no agreement within the New Zealand honey industry about which is best.

To address this issue, MPI has developed three broad options defining what constitutes a monofloral mānuka honey:

1. define mānuka honey based on a specified level of pollen (pollen count)
2. define mānuka honey based on methylglyoxal activity (MGO content)
3. combine both MGO content and pollen count.

Within both methods, there is a range of levels at which the standard could be set.

MPI is seeking feedback on the three options. In particular, the Ministry is requesting information on the likely impacts on businesses and scientific data that supports the robustness of the options.

**The Ministry for Primary Industries have formed a Primary Growth Partnership with Mānuka Research Partnership (NZ) Ltd and Comvita that invests more than \$1.7 million in research the development of high active mānuka plantations on back country land.**

## Overview

Mānuka Research Partnership NZ Ltd (MRPL) is a company created to manage the Primary Growth Partnership (PGP) programme. The company has three shareholders:

- **Nukuhau Carbon Ltd**, a family company belonging to Neil and Helen Walker from Taranaki. Neil is the Managing Director of MRPL.
- **D and C Tweeddale**, a large scale bee keepers with 17,000 hives in Taihape.
- **Aborex Industries**, a family company belonging to Dan and Diana Riddiford in the Wairarapa.

The company will be managing the PGP through Massey University, led by Head of the Institute of Food, Nutrition and Human Health, Professor Richard Archer and Professor Mike McManus.

Comvita is also a PGP partner and will channel its interest through MRPL. Comvita's Chief Technical Officer, Dr Ralf Schlothauer will be an independent director of the Company.

## The Programme

This research programme will develop mānuka plantation husbandry knowledge. It aims to increase productivity in the sector, to increase returns from mānuka honey.

The programme seeks to double of each of the following:

- hives per hectare
- Mānuka honey yield per hive
- the proportion of mānuka honey capable of sale as a medicinal product
- the land area in mānuka economically accessible to beekeepers

This would require less than 50,000 hectares of marginal land to be attracted into plantation mānuka. There is already around one million hectares of suitable land available.

## The Benefits

The additional benefits of PGP include:

- training of three PhD qualified scientists skilled in mānuka research
- integration of different industries
- development of profitable alternative land-use options for owners of marginal land.

The programme also has environmental benefits, including:

- speeding up the rate of hill-country remediation
- reducing the direct and indirect costs of erosion
- providing further carbon sinks.

Below is illustrated the potential increased farm returns that may be able to be achieved by utilising established mānuka blocks which are on marginal land and otherwise do not generate a cash return

### Example Farm

Example Farm		Per Farm
Area (Ha)	1,000	
Effective Area (Ha)	900	
Marginal Land	100	
Total Return \$/Ha	230	\$207,000
Farm Value \$/Ha	5,000	\$5,000,00
Return on Assets		4.1%

### Base Case Scenario (mānuka scrub)

		Per Farm
Hives per Ha	0.5	50
Honey kg/Hive	23.0	1,150kg
Honey Price \$/kg	\$30.0kg	\$34,500
Farmer Share	30%	<b>\$10,350</b>
Yield \$/Ha	104	
Carbon T/Ha	7.0	700.0
Carbon Price \$/T	3.0	<b>\$2,100</b>
Yield \$/Ha	21.0	
Farming Return \$/Ha	230	\$207,000
Mānuka Return \$/Ha	13.8	<b>\$12,450</b>
Total Return \$/Ha	244	\$219,450
Return on Assets		4.4%
% increase in returns		6.0%

### Better Scenario (full mānuka stand)

		Per Farm
Hives per Ha	1	100
Honey kg/Hive	23.0	2,300 kg
Honey Price \$/kg	\$30.0 kg	\$69,000
Farmer Share	30%	<b>\$20,700</b>
Yield \$/Ha	207	
Carbon T/Ha	15.0	700.0
Carbon Price \$/T	15.0	<b>\$22,500</b>
Yield \$/Ha	225	
Farming Return \$/Ha	230	\$207,000
Mānuka Return \$/Ha	48.0	<b>\$43,200</b>
Total Return \$/Ha	278	\$250,200
Return on Assets		5.0%
% increase in returns		20.9%

\$/Ha Returns are based on 900 Eff Ha to compare with base farming system.



Return of \$12,450 p.a. compounded at 7.50% for 20 years = \$539,140.  
 Return of \$12,450 p.a. based on 7.50% interest rate, 20 year repayment, and 21% tax rate = debt servicing capacity of \$95,191.

Return of \$43,200 p.a. compounded at 7.50% for 20 years = \$1,870,762.  
 Return of \$43,200 p.a. based on 7.50% interest rate, 20 year repayment, and 21% tax rate = debt servicing capacity of \$330,302.

Sources: ANZ, Comvita

Disclaimer: The above analysis is for illustrative purposes only and contain a series of assumptions based on market observations. The assumptions are not considered to be fact or to be used to base investment decisions off. Given the developing nature of the industry the above assumptions may prove inaccurate

