



APICULTURE

Ministry for Primary Industries 2015 apiculture monitoring programme

KEY POINTS

- The 2014/15 season produced another record honey crop at an estimated 19 700 tonnes. The main driver for the increase in honey production was the lift in hive numbers, although increased production in the lower North Island was also driven by good climatic conditions.
- Total registered hive numbers reached 575 000 in June 2015, an increase of 68 625 hives from the previous year, and close to double pre-varroa levels. Strong market demand for mānuka honey is driving the increase in hive numbers with expansion led by corporate and iwi investment. A third of all registered hives are managed by 25 beekeeping enterprises.
- The number of registered beekeeping enterprises has exceeded pre-varroa levels.
- The profitability of beekeeping enterprises in 2014/15 in the northern half of the North Island was impacted by lower honey crops due to poor weather conditions. Beekeepers in the rest of New Zealand generally had higher honey yields compared with last season. These increased yields combined with higher honey prices and lower operating costs lifted profitability in 2014/15.
- The value of New Zealand's pure honey exports increased again in 2014/15 driven largely by a lift in export prices. In 2014/15, honey export volumes to China were six-times that of 2011/12.
- Apiary losses of 10 to 50 percent were reported by some beekeeping enterprises in the North Island in spring 2014. High levels of *Nosema ceranae* and *Nosema apis* were present in affected colonies. An organism not previously recorded in New Zealand, *Lotmaria passim*, was discovered as part of the investigation and found in both affected and unaffected hives. It is unclear how long *Lotmaria* has been in New Zealand.
- The key issues facing the apiculture industry are ongoing concerns over bee health, competition for apiary sites, and maintaining the confidence of overseas consumers and regulators in the integrity of New Zealand mānuka honey.
- The Ministry for Primary Industries (MPI) is working with industry on a range of projects to support the health and development of bees and honey production and exports. Initiatives include research into honeybee genetics and bee nutrition, co-funding a baseline colony loss and survival survey, evaluating the technical and commercial feasibility of mānuka plantations, and establishing a regulatory science-based definition for monofloral mānuka honey.

Table 1: Key parameters of the New Zealand apiculture industry, 2010 to 2015

Year ended 30 June		2010	2011	2012	2013	2014	2015
Beekeeper and hive numbers							
Number of registered beekeeping enterprises ¹		2 957	3 267	3 806	4 279	4 814	5 551
Number of registered bee hives ¹		376 673	390 523	422 728	452 018	507 247	575 872
Honey production							
New Zealand annual honey production	Tonnes	12 553	9 450	10 385	17 825	17 600	19 710
Honey yield per hive	kg/hive	33.3	24.2	24.6	39.4	34.7	34.2
Honey prices²							
Bulk honey price range for light clover honey	NZ\$/kg	4.00-6.00	4.10-6.80	4.40-7.30	5.00-7.30	5.50-8.30	7.00-10.75
Bulk honey price range for mānuka honey	NZ\$/kg	7.00-37.50	8.00-80.50	8.00-50.00	10.45-60.00	8.00-85.00	9.50-116.50
Honey exports (pure honey)³							
Honey export volume	Tonnes	7 147	6 721	7 675	8 063	8 706	9 046
Honey export value (at fob ⁴)	Million NZ\$	98	102	121	145	187	223

Notes

1 Registered beekeeping enterprises and hives under the National Pest Management Plan for American Foulbrood.

2 Prices paid to beekeepers for bulk honey. The beekeepers supply the packaging (drums or intermediate bulk containers) and cover freight costs to the buyers premise.

3 New Zealand honey is mainly exported as pure honey in retail packs and in bulk. The data shown is for pure honey exports only.

4 fob = free on board

Source:ASUREQuality Limited and Statistics New Zealand.

PRODUCTION AND FINANCIAL PERFORMANCE OF APICULTURE IN 2014/15

The profitability of beekeeping enterprises in 2014/15 in the northern half of the North Island was impacted by lower honey crops due to cool wet weather prior to Christmas. Significant bee deaths in winter and spring in some parts of the North Island also affected individual businesses. Beekeepers in the rest of New Zealand generally had higher honey yields compared with last season. These increased yields combined with higher honey prices and lower prices for sugar and fuel, lifted profitability in 2014/15.

REVENUE FROM HONEY

Revenue streams for beekeepers are diverse. Non-mānuka honey producers enjoyed some of the highest prices for their honey and hive products in recent history.

2014/15 honey production

The 2014/15 season produced an estimated honey crop of 19 700 tonnes, eclipsing the previous record by around 1900 tonnes and 35 percent (5000 tonnes) above the six-year average (Table 2). Three quarters of the honey crop was produced in the North Island, in line with hive numbers.

The average hive yield of 34.2 kilograms was very similar to last year. The key driver in commercial beekeeping is to maximise profitability whilst managing risk. Beekeepers often forgo higher yielding crops targeting high value crops such as mānuka honey. Spring and early summer were cooler and wetter than normal in many parts of the country so areas reliant on pre-Christmas flowering crops had a lower honey crop in 2014/15. Beekeepers in Northland, Coromandel and Great Barrier Island were impacted the most as they rely on settled spring weather for an early mānuka honey crop.

Conditions improved at Christmas with warm sunny weather extending into autumn 2015 leading to good nectar flows. Mānuka performed well in Taranaki as it is a later flowering region. Most of the 2014/15 honey crop was produced after Christmas with good yields reported from pasture crops in particular.

Production of rewarewa honey was down due to unfavourable weather conditions prior to Christmas combined with an off-year for flowering.

The West Coast performed particularly well with good nectar flows from mānuka, kamahi and southern rātā. 2014/15 was an on-year in the flowering pattern of southern rātā. The West Coast region has had two good years in a row due to favourable weather and biennial flowering.

The impacts of the drought in Marlborough and Canterbury in 2014/15 were mitigated by beekeepers focusing on crops less affected by drought (e.g. bush honeys) and moving hives out of drought stricken areas. Pre-Christmas nectar flows in Marlborough and Canterbury were relatively good.

The hot, dry summer impacted negatively on nectar flows in parts of inland Otago and the Te Anau basin with Central Otago reporting a particularly poor thyme crop. Honey production in Southland was reasonable despite some clover producing areas being impacted by clover weevil.

Hive numbers continued to increase

Hive numbers increased by 68 625 from last year up to around 575 000 as at 30 June 2015 (Figure 1). This increase was driven by the strong market demand for mānuka honey, and primarily led by corporate and iwi investment in beekeeping enterprises. Hive numbers are expected to increase in the coming season, in particular in the North Island.

Hive numbers increased by 16 percent (57 975 hives) in the North Island compared with a seven percent (10 650 hives) increase in the South Island. Increased hive numbers in the North Island were due to a natural increase and hive purchases from the South Island. These purchases provide an important income stream for South Island beekeepers. The increase in hive numbers in the South Island was more than double that of last year, signalling a growing level of confidence and an increasing ability to manage varroa.

Table 2: New Zealand honey crop estimates, 2010 to 2015

	2010 (tonnes)	2011 (tonnes)	2012 (tonnes)	2013 (tonnes)	2014 (tonnes)	2015 (tonnes)	6 year average (tonnes)
Northland/Auckland/Hauraki Plains	1 285	2 000	1 200	1 905	2 580	2 175	1 858
Waikato/King Country/Taupo	1 584	1 400	1 535	2 465	2 980	3 120	2 181
Coromandel/Bay of Plenty/Rotorua/Poverty Bay	2 376	1 425	845	3 270	3 525	3 310	2 459
Hawke's Bay/Wairarapa/Manawatu/Taranaki/ Wellington	2 318	1 965	2 015	4 130	4 125	6 125	3 446
Marlborough/Nelson/West Coast	1 400	470	940	1 110	1 335	1 720	1 163
Canterbury/Kaikoura	2 200	1 045	1 650	2 815	1 795	1 865	1 895
Otago/Southland	1 390	1 145	2 200	2 130	1 270	1 395	1 588
New Zealand total	12 553	9 450	10 385	17 825	17 600	19 710	14 587
Yield/hive (kg)	33.3	24.2	24.6	39.4	34.7	34.2	31.7

Note

See *Information about the Commentary* for details on how the annual honey crop is estimated.
Source:ASUREQuality Limited.

The number of registered beekeeping enterprises increased by a further 15 percent (737 enterprises) in 2014/15 to 5551 enterprises; this is above pre-varroa levels (Table 3). The ratio of beekeeping enterprises between islands continues to move in favour of the North Island (Table 3) which accounted for 80 percent of new registrations (590 additional enterprises) in the last year.

Industry new-comers seem to be starting with a larger number of hives, 50 to 100 or more, rather than one or two hives as in the past (Table 4). This contributed to the 20 percent increase in beekeeper numbers in the 50-500 hive category. To manage this number of hives, such beekeepers would have had some training, most likely via national training providers for apiculture or working for commercial beekeeping operations.

The 1000+ hive categories have also seen significant increases with 23 new beekeeping enterprises in the past year (Table 4). The National Beekeepers' Association has recently defined a "mega commercial" beekeeping enterprise as one having more than 3000 hives.

There are 25 "mega commercial" beekeeping businesses in New Zealand as at June 2015 compared with 20 in the previous

year. This group operates under 33 beekeeping codes¹ and manage almost a third of all registered hives. There are 10 beekeeping enterprises with over 5000 hives each, all but one of which are located in the North Island.

World demand continues to lift prices for New Zealand honey

Honey prices paid to New Zealand beekeepers continued to climb in 2014/15 led by mānuka honey (see Table 5). The minimum price received for bulk honey was around \$7 per kilogram, a return not seen for any honey except mānuka and the best clover honeys a few years ago.

Prices for New Zealand honey have shown no signs of softening, while world honey prices recently fell from previous highs²,

1 Every beekeeping business is issued with a beekeeper registration code. Some larger beekeeping enterprises choose to operate different parts of their business (usually in separate areas) under separate beekeeper registration codes. These can also be structured into separate companies. Thus, one beekeeping enterprise can have multiple registration codes.

2 <http://www.honey.com/honey-industry/honey-industry-statistics/international-bulk-prices>

Table 3: New Zealand beekeeping enterprise, apiary and hive statistics¹, as at 30 June 2015

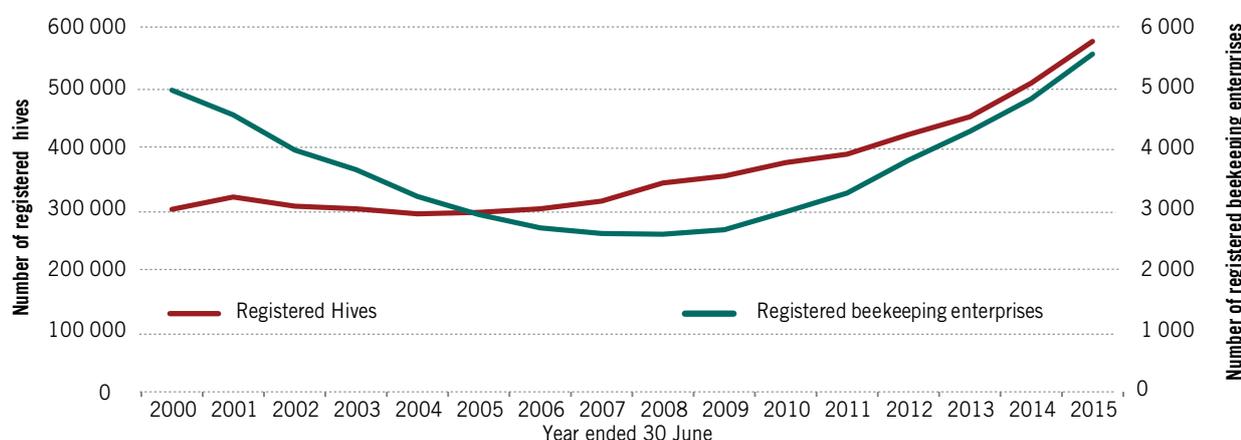
Region	Beekeeping enterprises	Apiaries ²	Hives ²
Northland/Auckland/Hauraki Plains	1 431	6 410	90 211
Waikato/King Country/Taupo	485	3 667	79 119
Coromandel/Bay of Plenty/Rotorua/Poverty Bay	609	5 048	119 208
Manawatu/Taranaki/Hawke's Bay/Wairarapa/Wellington	1 213	7 993	132 256
North Island	3 738	23 118	420 794
Marlborough/ Nelson/West Coast	439	2 977	42 729
Canterbury/Kaikoura	821	4 830	63 712
Otago/Southland	553	3 551	48 637
South Island	1 813	11 358	155 078
New Zealand	5 551	34 476	575 872

Notes

1 Registered beekeeping enterprises, apiaries and hives under the National Pest Management Plan for American Foulbrood.
 2 Regional location of apiaries is at their wintering sites. The regional location of hives is based on the location of the apiaries.

Source:ASUREQuality Limited.

Figure 1: Registered beekeeping enterprises and hive numbers in New Zealand¹, 2000 to 2015



Notes

1 Registered beekeeping enterprises and hives under the National Pest Management Plan for American Foulbrood. Varroa was discovered in hives in New Zealand in 2000.

Source:ASUREQuality Limited.

indicating that some consumers are prepared to pay a premium for New Zealand honey.

New Zealand exports of pure honey³ reached 9046 tonnes and \$223 million in the year to 30 June 2015, an increase of 4 percent in volume and almost 20 percent in value on the previous year. Honey export volumes to China have grown six-fold over the last three years (Figure 2).

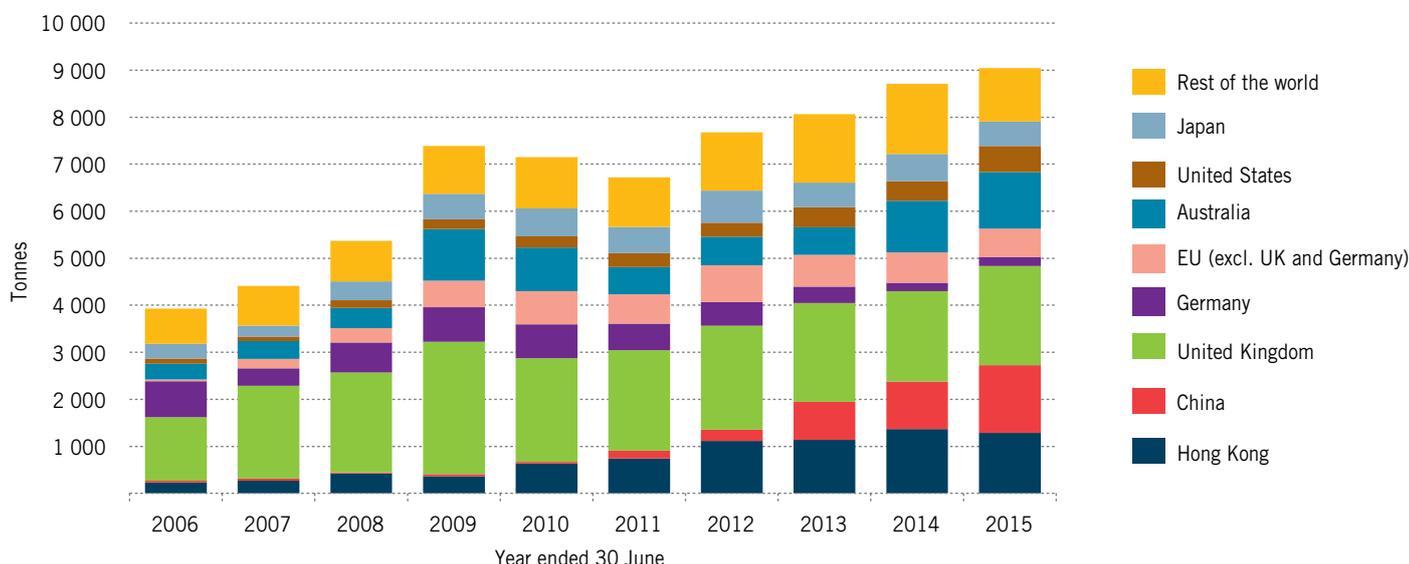
The gap in the volume of pure honey exported in retail packs versus bulk continues to widen. In the year ended 30 June 2015, 81 percent (7339 tonnes) of New Zealand honey was

exported in retail packs and 13 percent (1168 tonnes) in bulk packs (Figure 3).

The growth in retail packs is driven by strong consumer demand for retail packed honey and the desire by honey companies to protect their brands, and add value. Internet sales of honey is an increasing trend. The honey sector is responding by commissioning new packing facilities and increasing the capacity of existing plants. Capacity increases are being achieved via plant upgrades and increases in operating hours. Additionally, some businesses that previously exported bulk honey to be packed offshore have begun packing honey in New Zealand.

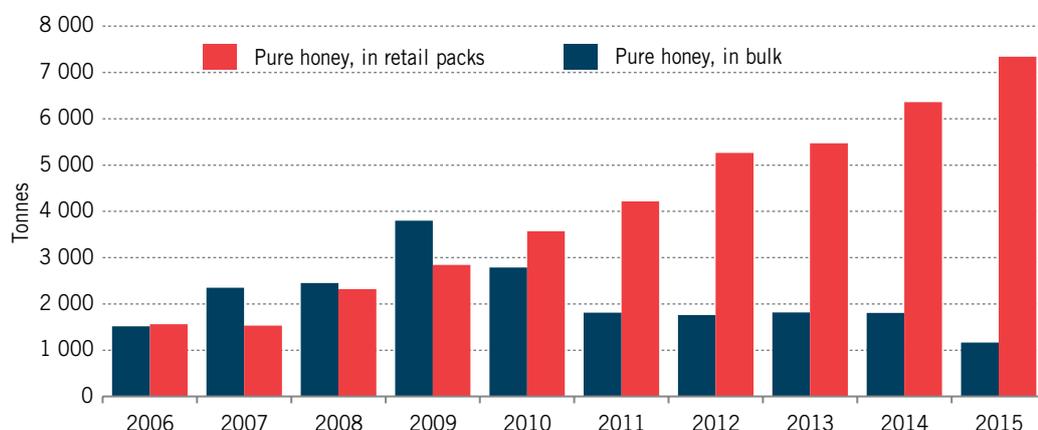
3 Pure honey exports includes honey sold in bulk and retail packs, and as comb honey and honeydew. New Zealand honey is also exported as an ingredient in other food and non-food products such as in bakery products, cosmetics, health supplements and medical products.

Figure 2: New Zealand pure honey¹ exports by destination, 2006 to 2015



Note
1 New Zealand honey is mainly exported as pure honey in retail packs and in bulk. The data shown is for pure honey exports only.
Source: Statistics New Zealand.

Figure 3: New Zealand pure honey¹ exports by product type (extracted honey), 2006 to 2015



Notes
1 New Zealand honey is mainly exported as pure honey in retail packs and in bulk. The data shown is for pure honey exports only.
Source: Statistics New Zealand.

OTHER REVENUE SOURCES

Pollination

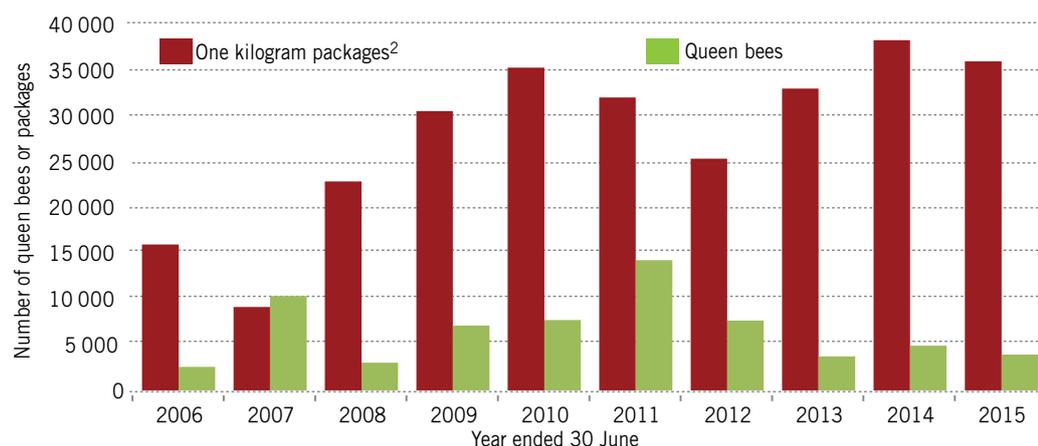
The area of horticulture crops such as blueberries, cherries, and G3 Gold kiwifruit grown under covers is increasing. Beekeepers are reporting large bee losses under fully enclosed covers with bees dying from inability to locate their hives, chilling and starvation. To manage the impact on bees, some beekeepers are replacing hives every 7 to 10 days before the hives become too weak or depleted. Others are experimenting with installing large orientation markers above and around the hive clusters and trying different locations for hives within the orchards. Pollination charges for crops grown under canopies has increased as a result.

Many beekeepers are concerned about the need to sugar feed beehives in pollination and the corresponding risk of honey adulteration showing up in C4 sugar tests, particularly for early nectar flows. There is also a perceived risk to bees from spray programmes designed to control Psa in kiwifruit orchards. A number of fruit growers are buying their own hives to ensure that they have sufficient hives for pollination.

Prices for kiwifruit pollination in 2014/15 were similar to last year ranging from \$115 to \$195 per hive, depending on the level of service provided. Beekeepers charging \$175 to \$195 provided transport to, and placement of hives within the orchards and three or four 1 to 2 litre feeds of sugar syrup. Some beekeepers charge a premium for placing hives in covered orchards as they observe that hive strength suffers in these orchards. Beekeepers charge \$115 to \$160 per hive when delivered into orchards nearby, or into depot or “dump sites”. Contractors then shift hives into and out of the orchards from the dump sites and feed them while in the orchards. These costs are born by the pollination broker.

Pollination prices for pipfruit remained relatively stable in 2014/15 at a price range of \$60 to \$110 per hive. Lower prices are for orchards close to the beekeeper’s base or for those ordering a large numbers of hives. Pollination prices for stonefruit ranged from \$90 to \$140 per hive with the highest prices paid by South Island apricot and cherry orchards, typically those under partial canopies.

Figure 4: New Zealand export of live bees¹, 2006 to 2015



Notes

1 Honey bees only. A small number of bumble bees are also exported.

2 All packages and the majority of the queen bees go to Canada.

The exporting season is late January to May.

Source:ASUREQuality Limited.

Table 4: Summary of beekeeping enterprises¹ by hive number

As at 30 June	2010	2011	2012	2013	2014	2015
5 hives or less	1 745	2 044	2 463	2 828	3 162	3 639
6 to 50 ² hives	695	678	774	843	964	1 109
51 to 500 ³ hives	319	336	351	379	443	530
501 to 1000 hives	99	109	115	122	124	129
1001 to 3000 hives	81	84	87	90	92	111
>3000 ⁴ hives	18	16	16	17	29	33
Total	2 957	3 267	3 806	4 279	4 814	5 551

Note

1 Registered beekeeping enterprises and hives under the National Pest Management Plan for American Foulbrood.

2 Beekeepers with 1-50 hives are considered hobby beekeepers.

3 Beekeepers with greater than 350 hives are considered commercial beekeepers.

4 Data for >3000 hives category between 2009 and 2013 is as at 31 March as data at 30 June is not available. Data for 2014 and 2015 is at 30 June.

Source:ASUREQuality Limited.

Table 5: Returns for apiculture products, 2010 to 2015

Year ended 30 June	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Bulk honey¹ (\$ per kg)						
Light (clover type)	4.00-6.00	4.10-6.80	4.40-7.30	5.00-7.30	5.50-8.30	7.00-10.75
Light amber	3.90-4.50	4.00-5.80	4.30-6.00	5.50-8.50	4.50-8.00	7.00-9.00
Dark, including honeydew	4.00-5.00	4.50-5.00	5.00-6.00	4.50-8.50	5.50-10.00	7.00-12.50
Mānuka	7.00-37.50	8.00-80.50	8.00-50.00	10.45-60.00	8.00-85.00	9.50-116.50
Beeswax² (\$ per kg)						
Light	...	7.00-7.80	7.00-7.50	7.50-8.50	8.00-10.50	9.00-12.50
Dark	6.00-6.50	6.00-6.80	5.00-7.50	6.50-7.80	6.50-7.80	8.00-10.00
Pollen² (\$ per kg)						
Not dried or cleaned	13.00-20.00	16.00-20.00	25.00-28.00	25.50-30.50	25.50-30.50	25.00-27.00
Cleaned and dried	30.00-36.00	32.00-38.00	35.00-40.00	40.00-45.00	40.00-45.00	40.00-46.00
Pollination³ (\$ per hive)						
Pipfruit, stonefruit and berryfruit	52.50-96	60-120	60-120	60-120	60-120	60-140
Kiwifruit						
– Hawke's Bay	145-170	104-160	104-160	120-180	120-185	120-180
– Auckland	120-150	120-150	120-150	120-150	120-150	120-150
– Bay of Plenty	120-175	110-178	115-200	120-195	140-210	142-195
– Nelson	125-145	120-150	120-150	120-150	120-150	115-195
Canola and small seeds (carrots)	100-150	120-150	100-180	150-195	150-195	150-195
Live Bees²						
Bulk bees for export (\$ per 1kg package)	25-26	26-27	27-28	27-29	27-32	28-32
Queen bees (per queen) local sales (\$)	25	25	28	33-37	33-37	30-37

Notes

All prices are exclusive of GST.

1 Prices paid to beekeepers for bulk honey. The beekeepers supply the packaging (drums or intermediate bulk containers) and cover freight costs to the buyers premise.

2 Prices paid to beekeepers. The beekeepers cover the freight costs to the buyers premise.

3 Prices paid to beekeepers. Prices at the lower end of the range are for hives delivered to depot sites. Upper end prices include delivery into the orchard and sugar for 3 to 4 one-two litre feeds to stimulate the bees to collect pollen.

Source:ASUREQuality Limited.

Table 6: New Zealand exports of beeswax, 2006 to 2015

Year ending 30 June	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Export volume (tonnes)	235	178	107	139	141	161	169	180	148	118
Export value (\$ million fob ¹)	1.76	1.40	1.01	1.36	1.21	1.45	1.59	1.85	1.71	1.57

Notes

1 Free on board.

Source: Statistics New Zealand.

Table 7: Estimated expenditure for beekeeping operations¹, 2013, 2014 and 2015

Year ended 30 June			2012/13	2013/14	2014/15
Labour	Worker	\$ per hour	15-25	15-27	16-33
	Manager	\$ per hour	25-50	24-75	28-75
	Average working week	hours	45	45	45
	Average ratio of hives per fulltime equivalent (FTE) with varroa present in the hives	hives:FTE (pre-varroa)	350:1 (800:1)	350:1 (800:1)	350:1 (800:1)
Fuel	Fuel (dependant on world price and exchange rate)		Variable		
Sugar	Bulk sugar (variable depending on overseas prices and NZ exchange rate)	\$ per tonne	1 050-1150	865-1180	758-1044
Varroa treatment	Varroa treatment (variable according to hive strength and product(s) used)	\$ per hive	22-25	25-28	22-35
	Varroa strips (applied at recommended rates, two treatments per year)	\$ per 1000 plus strips	24-25	25-28	22-35
Protein supplements	Hives may require 1–2 kilograms per year	\$ per 20 kilogram bag	162	162	155-163
Contract extraction costs	Extraction of mānuka honey (costs more as the frames must be pricked first to release the honey)	\$ per frame	1.20-1.56	1.00-2.31	1.06-2.25
	Extraction of clover honey	\$ per frame	1.00-1.37	0.50 -1.34	0.60-1.50
Hives	Perfect condition hive, includes 2 brood boxes, floor, lid and 1 honey super, no bees, assembled and paraffin waxed	\$ per hive	251	210	226
	Reasonable condition hive, includes 2 brood boxes and 1-4 honey boxes with bees	\$ per hive	350-400	300-510	600-1000
	4-5 Frame nucleus hive; new hives includes nuclei box	\$ per hive	100-230	160-230	150-260
	Repairs and maintenance, 7% of hive purchase price	\$ per hive	24-28	11-28	28-42
	Wax to coat plastic frames	\$ per kilogram	10-11	9-11	14-16
	Hive Strappers, used as required	\$ per unit	10-12	7-11	7-11
	Bees	Queen bees	\$ per bee	33-37	33-37
Select queens		\$ per bee	200	200	...
Select breeder queens		\$ per bee	1000-1638
Protective clothing		\$ per suit	138	91-185	139-189
Honey drums	New or re-manufactured honey drum (holds approximately 300kg of honey)	\$ per drum	58-77	55-100	79-100
		\$ per hive	30-180	40-180	50-130
Apiary rentals paid to landowners	Mānuka sites (rental is paid either as a per hive rate, percentage of crop when sold or a combination of both)	\$ per apiary	...	500-1000	500-1000
		% of crop	10-30	7.5-30	10-30
		\$ per hive + % of crop	\$10-50 10-25%	\$25-60 10-38%	\$25-60 10-38%
		grams per hive	Variable, often 500		
Compliance costs	Risk Management Programme (RMP) annual audit costs	\$ for processing RMP	up to 1300	up to 1300	up to 1350
		\$ for a storage RMP	up to 750	up to 750	up to 795
	MPI Food Safety Authority annual fees	\$ if require export eligibility	577.5	577.5	590
	Auditing of electronic certificates	\$ per eligible document	up to 65	up to 65	up to 67
		\$ per month auditing 10% of eligibility declarations raised	65	65	up to 67
	Tutin tests	\$ per sample (first sample)	125	90-125	90-125
		\$ per composite (up to 10 samples can be composited)	15	15	10-15
	American Foulbrood Strategy Levy	\$ per apiary	20	20	20
		\$ per membership	14	14	14
	National Beekeepers' Association Membership (voluntary)	Hobby beekeeper (1–10 hives)	\$ per membership	130	150
Sideline to small commercial (11–250 hives)		\$ per membership	162-319	186-367	180-354
Commercial operations (251–3001+hives)		\$ per membership	513-3000	590-3450	570-3331
Corporate membership		\$ per membership	274	315	304
Beekeeping clubs		\$ per membership	243	200	193
Beekeeping Industry Group membership	Voluntary – affiliated with Federated Farmers	\$ per membership	104-520	120-598	110-552

Note

1 Expenses are excluding GST.

Source:ASUREQuality Limited.

Small seed pollination now commands prices similar to kiwifruit pollination at \$150 to \$195 per hive. While there is no sugar feeding of these hives, there is often a cost associated with stripping hives off early crops⁴, re-making hives, and the opportunity cost of a lost honey crop as pollination occurs over the Christmas period. Beekeepers are also mindful of pesticide risks with seed crops.

Live bee exports

Live bees exports to Canada continued to provide a good income stream for a number of North Island beekeepers this year.

Bees are exported in one kilogram packages housed within a ventilated cardboard tube or a cardboard and wire screen box about the size of a shoe box. The package may hold a supply of sugar syrup and a queen bee in a cage.

Demand for live bees from Canada remained strong this season with 35 431 one-kilogram equivalent packages exported (Figure 4). The two key factors that influence Canadian demand for live bees are world honey prices and colony losses over winter. World honey prices remained strong throughout the latter part of 2014 and into early 2015 when packages were being ordered, increasing demand. However, winter losses in Canada were much lower than in previous years partially offsetting this increase in demand. As live bees can only be shipped from Auckland International airport, most bees are produced by beekeepers who can deliver to collection centres in Hawke's Bay, Tauranga or Rotorua.

Bumble bee shipments to the Maldives are increasing with 2300 individual bees sent in the year to 30 June 2015, almost double that of last season. These bees are mainly used to pollinate crops grown in greenhouses.

Propolis and beeswax

Propolis is a resin collected by bees from some tree species and marketed as a dietary supplement. Demand from Asia is increasing.

Beekeepers gather the propolis off special mats placed in hives or by scraping boxes and frames. Propolis in this form is regarded as raw propolis as it contains some beeswax (the proportion of which varies throughout the season) and well as other contaminants such as parts of bees. Pure propolis is the processed product that has been separated from beeswax and other contaminants.

The recovery rate of pure propolis from raw propolis is approximately 37 to 47 percent early in the season. This decreases to 15 to 25 percent recovery when the nectar flow is on as bees add more wax to the propolis when honey is being produced. Beekeepers reportedly received \$53 to \$183 per kilogram for the raw unprocessed product, with quotes of \$350 to \$390 per kilogram noted for the pure product.

Demand for propolis was strong in 2014/15 with the few processors in the market looking to extend their supply base. This has resulted in a significant increase in the price paid to beekeepers. More beekeepers have been encouraged to collect propolis because of higher prices and processors providing a delivery and pick up service for the mats.

Demand for beeswax remained strong in 2014/15. The continued growth of the local beekeeping industry has increased domestic demand for foundation wax and wax for the coating of plastic frames. While demand has increased, domestic supply of beeswax has reduced with some large beekeeping operations moving away from the use of un-cappers in favour of just pricking the honey frames. This reduces the overall cost of the honey extraction plant and can speed up throughput, but also significantly reduces the amount of wax removed from the frames during the extraction process. The combination of reduced supply and increased domestic demand has resulted in a corresponding reduction in export volumes in the year to 30 June 2015 to 118 tonnes, the lowest export volume since 2008 (Table 6).

Export prices for beeswax increased in 2014/15 to \$13.31 per kilogram compared with \$11.55 last season. This reflects the fact that a greater proportion of wax was exported as further refined products rather than in blocks.

Beehives

The cost of bee colonies in 2014/15 increased significantly compared with last year driven by increasing returns from beekeeping (see Table 7). While this is a cost for many beekeepers looking to expand, it is also an opportunity for established beekeepers looking for other sources of income. Beekeepers providing "one box" hives could expect typical returns of \$300 to \$400, with spot prices of up to \$600 being reported. Some beekeepers are providing 5 to 6 frames of bees for collection (i.e. the buyer provides the supers, lid and floor) at \$150 to \$260. The trade in beehives from the South Island to the North Island is particularly strong.

⁴ Stripping off early crops means shifting hives from early flowering crops, removing the honey and then preparing the hives for pollination.

OPERATING COSTS (TABLE 7)

Sugar

Sugar prices eased again this year with beekeepers paying between \$758 and \$1044 per tonne dry weight. Beekeepers paid more for sugar at the start of the season which accounted for some variability in the price; additional contributors to this variability were transport costs and the formulation in which the sugar was delivered.

World sugar supplies remained in surplus in 2014/15. This coupled with increased competition in the New Zealand sugar market has forced the price of sugar down to levels not seen for several years. The world sugar surplus was driven in part by a Brazilian cane harvest similar to last year's record, Indian and Australian production holding steady and Thai production rising slightly. Both the Brazilian and Indian currencies devalued against the US dollar, cushioning these markets from the falling price and ensuring that plantings remained at existing levels.

Most beekeepers prefer to pay a little extra to have ready mixed liquid syrup delivered. The amount of sugar fed this season was variable despite the harsh spring in many areas. Beekeepers are acutely aware of the issues around accidental or deliberate sugar adulteration. Rapidly expanding export markets such as China are actively checking honey for evidence of adulteration. There are increasing reports of mānuka honey producers retaining bush or clover honey to feed their bees rather than using sugar.

Fuel

Beekeepers enjoyed lower average fuel prices in 2014/15 compared with recent years.

Labour

The average wage and the variation in wages paid to beekeeping staff increased slightly in 2014/15. Many business owners commented that they offered wage increases much higher than inflation to retain good staff. Remuneration packages, particularly for managerial staff are variable. They can include mobile telephones, production bonuses, vehicles, extra holidays, or the use of extracting plant and machinery if employees own their own hives.

Commercial-scale beekeeping operations typically employ an average of one beekeeper for every 500 hives. However, this does not take into account non-beekeeping staff such as processing factory, administration or maintenance staff. Larger beekeeping operations are employing an average of one full-time labour unit per 350 hives once non-beekeeping staff are taken into account.

Site rentals

The average price paid for apiary site rentals has increased considerably over the past year with strong competition for mānuka sites and increasing interest in other sites such as those used for spring build up. Although the price range hasn't increased, prices paid for mānuka sites are tending towards the top end of the range. Some sites previously provided with pots of honey as payment are now attracting monetary fees. Beekeeping enterprises are increasingly engaging with landowners and offering large payments for exclusive rights to properties.

In the past few years, the increasing cost of site access altered the economics in favour of land purchase with some beekeepers buying marginal land with mānuka. With increasing interest in mānuka, the price of marginal land has gone up in some areas to the point where purchasing land is no longer economically viable for some beekeepers.

INDUSTRY ISSUES AND DEVELOPMENTS

UNEXPLAINED BEE LOSSES IN SPRING

A number of North Island beekeepers reported significant unexplained bee loss in the spring of 2014 ranging between 10 and 50 percent of their total hive holdings. Not all beekeepers suspected something insidious with many suggesting combinations of high varroa loadings, pollen shortages, bad matings, or unfavourable spring or previous autumn climatic conditions. An investigation was carried out involving several organisations and individuals, including the Ministry for Primary Industries (MPI), focusing on the Coromandel where there was a high concentration of beekeepers who suffered losses. High levels of *Nosema ceranae* and *Nosema apis* were present in affected colonies. An organism not previously recorded in New Zealand, *Lotmaria passim*, was discovered as part of this investigation and found in both affected and unaffected hives. It is unclear how long *Lotmaria* has been in New Zealand.

IMPORT HEALTH STANDARD FOR HONEY

The apiculture industry remains concerned about the biosecurity risk of imported honey. MPI is continuing with the drafting of a new risk analysis taking into account the results of on-going research into the thermal stability of Israeli Acute Paralysis virus in honey. No changes to the importation of honey into New Zealand will be made until this research and the following documents are completed: a new risk analysis, a new risk management proposal, and an import health standard covering importation of honey from all countries. These documents will be available for public consultation.

GIANT WILLOW APHID AND WASPS

The giant willow aphid (*Tuberolachnus salignus*) has spread to most parts of New Zealand.

Beekeepers are reporting difficulties in extracting honey made by bees harvesting honeydew secreted by giant willow aphids. This honey crystallises quickly in the frames.

The honeydew is also available to wasps, with stronger overwintering wasp nests observed in several parts of the country in 2014/15. Beekeepers reported many hive deaths as a result of wasps; some were forced to control wasps via baiting or searching for and destroying nests. In the worst affected areas, beekeepers had to remove their hives.

REVISED TUTIN STANDARD

The new tutin limit of 0.7 milligram per kilogram of honey came into effect on 12 March 2015, down from 2.0 milligram per kilogram. Stock in trade provisions applied for product that was retail packed before this date. Bulk honey had to meet the new limit from this date because it was able to be blended to comply. As anticipated, this led to an increase in the amount of blending and re-testing undertaken. Re-testing is required when composite testing shows that all components are less than the old tutin standard, but are inconclusive when the new standard is applied.

THE DEVELOPMENT OF A MĀNUKA SUPPORT INDUSTRY

The increase in hive numbers is being driven by strong market demand for mānuka honey, and is primarily led by corporate and iwi investment in beekeeping enterprises.

Mānuka support sites are a developing trend including (i) “nursery sites” – usually pasture-based sites to build up bee and hive numbers for mānuka honey production and (ii) wintering/spring sites for hives involved in mānuka honey production. Site selection for either nursery or wintering sites is influenced by bee nutrition, in particular pollen sources, and ease of access for hive management. There is increasing competition for good spring pollen sites.

LABELLING STANDARDS

In response to a widespread lack of understanding (and therefore non-compliance) around labelling of retail honey, MPI issued the industry timeframes for addressing label compliance in late spring 2014. The compliance timetable commenced on 1 January 2015 when all labels were to contain lot identifiers, and have therapeutic and health claims removed. The need to comply from 1 January 2015 resulted in a lot of angst over the 2014 Christmas period for honey packers. Subsequent timelines required that the nutrition information panel be compliant and grading systems explained (for example, UMF® and MGO™).

MONOFLORAL STANDARDS AND LABEL CLAIMS FOR MĀNUKA HONEY

As the price of mānuka honey continues to rise, domestic and overseas consumers are increasingly concerned that honey labelled as “mānuka” is authentic. MPI issued an “Interim Labelling Guide for Mānuka Honey” in July 2014 as a first step in formally addressing this issue. MPI is leading and managing a two-year science programme with the aim of establishing a regulatory, science-based definition for monofloral mānuka honey by the end of 2016. MPI is working with industry to ensure that the programme outcomes are fit for purpose and practical to implement.

INDUSTRY UNITY

In 2014, the National Beekeepers’ Association Executive Council and the Federated Farmers Bee Industry Group set up a group called the Bee Industry Advisory Council (BIAC). In response to widespread support at the 2014 Apiculture Conference, BIAC was charged with investigating the development of a national body to provide a unified voice for the New Zealand apiculture industry. BIAC presented their recommendations at the 2015 Apiculture Conference and the issue of industry unity was a topic of interest to most of the conference delegates. The proposal has been consulted on and the group has sought nominations for individuals to progress the next stage of developing the industry body which also includes investigating funding options. The big change for beekeepers is that there will be more representation from the non-beekeeping sectors of the industry.

CURRENT MPI-FUNDED APICULTURE AND HONEY PROJECTS

Table 8: MPI-Funded apiculture and honey projects

Primary Growth Partnership	<p>High-performance Manuka Plantations (in progress) The PGP Programme led by Manuka Research Partnership (NZ) Limited and Comvita Limited aims to move the industry from wild harvest to science-based farming of mānuka plantations.. More information: www.mpi.govt.nz/funding-and-programmes/primary-growth-partnership/primary-growth-partnership-programmes/high-performance-manuka-plantations/</p>
	<p>Trees for Bees: Producing abundant bee pollinators for sustainable farming (in progress) This project aims to increase the number of strong, healthy honey bees to ensure pollination services for agricultural crops. In many areas, pollen and nectar sources are being removed leading to poor nutrition for bees. They become weakened, malnourished and sometimes starving. To restore flowers for bees we are installing demonstration plantations of trees and shrubs to show how to supply a steady source of high-protein pollen to support bee colonies. The result will be more bees for pollination services leading to increased crop and pasture yields. More information: www.treesforbeesnz.org/research/project-4-producing-abundant-bee-pollinators-for-sustainable-farming</p>
	<p>A collaborative industry approach to reduce the threat of pyrrolizidine alkaloids in honey (in progress) The Bee Products Standards Council (BPSC) is undertaking a significant research project to ensure that New Zealand honey remains a safe food. More information: http://maxa.maf.govt.nz/sff/about-projects/search/12-018/index.htm</p>
	<p>Sustainable beekeeping by and for Māori landowners (in progress) The project aims to assess and develop year round nutritional resources for honey bees to promote sustainable residential beekeeping on Māori land. More information: http://www.mpi.govt.nz/document-vault/7079</p>
Sustainable Farming Fund	<p>Developing a Bee Industry in Te Riu O Waiapu: A Project Management Role (recently completed) The project aims to address a core and critical phase of a long-term project and vision for a substantial beekeeping and whanau-based bee product industry for the Waiapu, a whanau-based community in the East Cape area. More information: http://archive.mpi.govt.nz/environment-natural-resources/funding-programmes/sustainable-farming-fund/sff-maori-agribusiness-projects-2012</p>
	<p>Honeybee genetics for sustainability and pollination security (recently completed) The project aims to deliver practical solutions that will increase the sustainability of beekeeping, and its effectiveness in servicing NZ's primary industries. We will apply new genetic assays to identify at-risk bee populations and provide breeding strategies to improve their genetic resilience. We will also trial a novel technique to identify bees with improved pollination performance and determine whether this trait can be selected for within breeding programmes. More information: http://maxa.maf.govt.nz/sff/about-projects/search/12-017/index.htm</p>
	<p>Trees for Bees: Flowers for healthy bees in times of pollen dearth (recently completed) The project aims to improve honey bee health by increasing the availability of nutritious pollen sources by: identifying good Bee Plants that have protein-rich pollen and flower at the right times especially when there is a pollen shortage; trialling the use of good Bee Plants that are the most practical plants for farms; and encouraging farmers to plant good Bee Plants to protect and support bees. More information: http://www.treesforbeesnz.org/research/healthy-bees</p>
Other MPI funded projects	<p>Bee health survey (in progress) Funded by the National Beekeepers Association of New Zealand, Federated Farmers Bee Industry Group, Agcarm and the Ministry for Primary Industries. The project is scheduled for completion in December 2015. More information: https://www.landcareresearch.co.nz/science/portfolios/enhancing-policy-effectiveness/bee-health</p> <p>Mānuka honey science programme (in progress) This project aims to develop and validate a robust scientific definition for monofloral mānuka honey. More information: http://archive.mpi.govt.nz/food/food-safety/manuka-honey/mpi-manuka-honey-science-programme</p>

INFORMATION ABOUT THE COMMENTARY

This commentary was developed from information gathered through surveys completed by beekeepers, honey packers and exporters and augmented with a review of export documents, the apiary database and published reports.

Honey production, price and expenses figures are based on a survey of a range of beekeeping enterprises that account for 40 to 50 percent of registered hives in New Zealand. The survey is administered byASUREQuality Limited during their annual Risk Management Programme audits and/or hive audits, and via targeted interviews. Surveys record honey crop information based on the beekeeper enterprise location, not apiary (or hive) locations.

The data recorded in the surveys are extrapolated to provide an estimate of national honey production, price ranges for honey and honey products, and expenses for beekeeping operations.

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