International recognition of Manuka

In year 2014, total honey exports were $202M. In 2015, total honey exports were $285M, a 41% increase in 12 months.

Australia imported $48.6M of NZ honey, UK $46M, China $45.3M, Hong Kong $34.8M, USA $26.3M, Singapore $20M, and All Others 64M.
Government target

- Government has set a target for Manuka honey exports of $1B pa in exports by 2028.
- There is estimated to be 900,000ha of indigenous Manuka forest which is unlikely to be enough area to reach this $1.2B target set by the government.
Size of indigenous Manuka forest

- A large portion of the 900,000 ha of indigenous Manuka is in Maori ownership.
- Export revenue from the 900,000 ha of indigenous Manuka forest is likely to flatten out at $400M pa.
- Current new plantings of Manuka forest are increasing at a rate of 4000 ha per annum which equates to +/- half a percent increase on the 900,000 ha of Manuka forest per annum.
Why Manuka?

- Nett Profit per ha on **Pastoral Farming** is +/- $228 per ha (Beef and Lamb figures).
- Nett Profit per ha on **Pine Forestry** is +/- $634 per ha (huge variation in profitability).
- Nett Profit per ha on **Manuka** is +/- $1360 per ha (and cashflow begins from Year 3).

If a Pine Forest harvest is less than 300 tonnes/ha, and the average price is less than $100/tonne, and the forest is more than 150km from the port, the Pine Forest is unlikely to break even.
Manuka is special to New Zealand

- It contains medicinal properties in the honey and leaf oil.
- It is a native species.
- It is non invasive, unlike Pines.
- It requires no chemical sprays.
- It has few natural pests or diseases.
- Manuka plants will self regenerate naturally.
- A Manuka forest can grow indefinitely if it’s kept free of other plant species.
- Manuka honey and oil is recognized internationally as coming from NZ (like Scotch whiskey comes from Scotland).

The (Unique Manuka Factor) UMF brand is internationally recognized and is trade marked by the (Unique Manuka Factor Honey Association) UMFHA.
Key drivers of increased MGO in Manuka Honey

• The key anti bacterial compound in Manuka honey is called Methylglyoxal (MGO). MGO is converted from an enzyme in Manuka nectar called Dihydroxyacetone (DHA).

• Higher levels of DHA in the nectar will convert to higher levels of MGO in the honey.

• Larger and more pure stands of Manuka trees will result in less dilution in the honey.

• Honey stored for 12-18 months at 22 degrees C will convert most of the DHA to MGO.

• Low pH and low fertility soils may help increase DHA in the nectar.

• Climatic temperatures might have an influence on DHA in the nectar.
KPN’s plant selection program

- Our current selection goals include: higher levels of DHA in the nectar; greater volumes of nectar in the flowers and more flowers on the plants.
- Our highest DHA plant to date is 29,600 mg/l.
- The average DHA level across all indigenous Manuka in NZ is around 2,000-3,000 mg/l.
- We have identified more than 120 individual selections which all exceed 8,000mg/l of DHA.
- These 120 high DHA plants have come from a wide range of provenances including South Island provenances and semi alpine provenances.
- These 120 selections are currently being used for seed production for producing plants for new Manuka forestry plantings.
- The plants from each individual selection is identified in the nursery via a unique coding/labelling system

A number of trials will be planted around NZ this year.
KPN’s future selection program

- We will continue to identify superior Manuka selections and raising the benchmark for DHA, floriforousness and nectar volumes.
- Continue to test and record the performance of all selections in all regions throughout NZ.
- Develop a technique for measuring the DHA levels in fresh honey harvested from a selection with a known DHA level in the nectar.
- Continue identifying a range of selections with superior Manuka oil characteristics.
**Planting rates**

- Traditional planting rate is 1111 plants per ha (3m x 3m).
- KPN generally recommends 1600 plants per ha (2.5m x 2.5m).
- Gentle contoured land = 2500 plants per ha in hedgerows (2m x 2m). Hedgerows can be trimmed and sold for leaf oil extraction. Trimmed plants can be maintained in a juvenile state increasing their longevity.
Planting costs

- 50 cell trays: At 1600 plants per ha the total cost for plants, planting and fertilizer is $2,400 per ha (does not include weed control costs).
- 28 cell trays: At 1600 plants per ha the total cost for plants, planting and fertilizer is $3,840 per ha (does not include weed control costs).
- KPN also supplies planting services, weed spraying, and cash forecasting for new plantations.
- Plants available from May 2017.

Financial subsidies and grants are available for forestry establishment through MPI’s Afforestation Grant Scheme, Regional Councils, the East Coast Forestry Project, and Nga Whenua Rahui.
Manuka plantation honey harvest

- The first honey crop begins in year 3.
- Maximum honey yields are achieved from year 6 onwards.
- Maximum hive stocking rates are reached from year 6 onwards is 2 hives per ha.
- Honey yields from year 6 onwards are +/- 50 kg per ha.
- Current average price paid to beekeeper is +/-$40 per kg
- Hive operational cost is approx. $350/hive per annum incl labour cost.
Income (Revenue, Cashflow, Nett Profit)

- Revenue from honey per ha from Year 6 onwards is approx. $2000 per ha.
- Revenue from Carbon Credits from year 6 onwards is approx. $60 per ha.
- Beekeeping costs from year 6 onwards is approx. $700 per ha.
- If capital costs are borrowed at 5% per annum and repaid over the first 5 years, the cash flow should peak at (-$1641) per ha in year 3.
- Cash flow should return to positive by Year 6. (all capital costs should be paid off by year 6)
- Nett Profit should run at approx. $1360 per ha from year 6 onwards.
### Key Points

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<tr>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>Planting rate 3m centres</td>
<td>1111 plants per ha</td>
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<tr>
<td>Planting rate 2.5m centres</td>
<td>1600 plants per ha</td>
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<tr>
<td>Planting rate 2m centres (or in hedgerows)</td>
<td>2500 plants per ha</td>
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<tr>
<td>Average planting cost for 50 cell plants (at 1600 stems/ha)</td>
<td>$2400 per ha (includes plants, planting, and fert.)</td>
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<tr>
<td>Average planting cost for 28 cell plants (at 1600 stems/ha)</td>
<td>$3840 per ha (includes plants, planting, and fert.)</td>
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<tr>
<td>Tree protectors (Optional)</td>
<td>$0.80 per plant (depending on rodent infestation)</td>
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<tr>
<td>Pre planting weed control (Optional)</td>
<td>$350 per ha (depending on weed infestation)</td>
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<tr>
<td>Stacking rate for commercial Manuka plantations</td>
<td>2-4 hives per ha</td>
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<tr>
<td>Price range for Manuka honey</td>
<td>$25-$125 per kg (depending on MGO levels)</td>
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<td>Honey yield range</td>
<td>15-60kgs per hive</td>
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<tr>
<td>Peak Cash flow deficit at Year 3</td>
<td>-$1641 per ha</td>
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<td>Year Cash flow becomes positive (after repaying all Capital costs)</td>
<td>Year 6</td>
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Soil types

Manuka does well in a range of soil types including:

- Sand, volcanic, clay, peat, limestone, alpine and pakihi soils.
- Swampy soils where the roots of the plant never dry out.
- Barren windswept hillsides where they are constantly battered by salt laden winds.
Selecting a site

- Consider proximity of indigenous Manuka forests and physical barriers for bees (e.g. wide block of pines or water) which may isolate bees from travelling to non Manuka nectar sources.
- A good site is a sheltered valley with high hills on either side.
- Manuka thrives on northern and eastern facing hillsides.
- Avoid proximity to large sources of non Manuka nectar.
For gorse, tobacco weed, or wilding pines, spray the whole block with Grazon to eradicate. Wait 12-30 weeks before planting so Grazon residues have dissipated.

If gorse, tobacco weed, or wilding pines are not an issue, only use Roundup to eradicate grass and weed species. Spray grass land with Roundup in strips 2.5m apart, or spray 500mm circles where plants will be planted (wait 1 week).

For planting, loosen the soil to make it easy for the roots to spread outwards.
Choosing Manuka provenances

- The local provenance should be planted with plants from other provenances, to spread the flowering duration for 8-12 weeks.
- In cold regions, selections need to be able to withstand hard frosts and snow.
Other considerations

- Pollen rich species such as Tree Lucerne (*Chamaecytisus palmensis*) should be planted around the apiary site.

An ideal forest size would be 50ha or more.
It is advisable to position bee apiaries in the center of a Manuka forest.
Post planting

- It may be necessary to release the plants from grasses, one year after planting by spraying *Gallant* over the top of the Manuka.

- Manuka produces higher MGO honey in low pH and low fertility soils (so don’t add lime or fertilise soil). Add Sulpher to soil if necessary to reduce the pH.

- Goats, wallabies and hares are known to eat the plants, especially in the first year after planting.
Industry and Market Risks

Honey volume and price can be reduced by:

• Adverse climatic conditions affecting flowering and bee activity.
• Dilution of Manuka honey from other nectar producing plants.
• Beekeeping diseases and bee starvation.
• Poaching and thieving.

Poaching will likely require government legislation and industry standards to help overcome this issue.
Challenges in harvesting pure Manuka honey

- Manuka is not a preferred nectar species of honey bees.
- Honey bees prefer clover and native species such as kamahi, towai and rewarewa, which will dilute the Manuka honey and reduce the MGO.
- The larger the Manuka plantings, the less likely the bees are going to collect nectar from other sources.
- Manuka will be overtaken in time by other species if other species are not controlled.

The demand for Manuka honey is highly unlikely to reduce. It is far more likely to increase.
Potential economic upsides

- Manuka Leaf Oil production can complement income without adversely effecting honey production.
- Foliage for Manuka oil extractors ($500-$600 per tonne for raw foliage).
- As value of Manuka honey increases, so too is capital value of land.
- Hive stocking rates can be expected to increase 2-4 hives per ha when superior selections flower.
- Price per kg is expected to increase for medicinal grade honey.
KPN’s proposal to YOU.

- KPN is interested in talking to Maori Trusts and land owners who own land areas larger than 100ha in size, who are interested in long term share deals.
- KPN is looking at a business model whereby KPN supplies and pays for the superior selection Manuka plants, the planting costs, and supplies its own beekeepers.
- The Landowner would supply land on 15 year (minimum) lease.
- The honey income would be shared between the Landowner and KPN.