
Establishing a Kānuka Industry in Aotearoa

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Disclaimer:

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Why Establish a Kānuka Industry?

Despite kānuka being a known rongoā, and compelling evidence for it having scientific efficacy, the kānuka industry remains underdeveloped. The size of the potential commercial opportunity is large: Aotearoa's natural products industry is worth NZ\$1.4 B annually and growing.

A successful kānuka industry would be transformational for Māori, with economic and employment gains to rural communities, self-employment opportunities, enhancing biodiversity on Māori land, and increasing land use options that support social and cultural wellbeing by restoring and supporting the health of the whenua.

There is a compelling case to invest in the collective development of the kānuka industry. There has been demonstrable growth in mānuka oil and related products on the back of COVID, and there is increasing global demand for new indigenous plant extracts. Global markets already understand the value proposition of mānuka honey, mānuka oil and other indigenous plant products, and the pathway to market is clear and accessible for kānuka products.

What Is Kānuka?

Kānuka is a tree from the Myrtaceae family, which includes economically significant trees such as mānuka (*Leptospermum scoparium*), Australian tea tree (*Melaleuca alternifolia*), those with emerging commercial potential (e.g., *Kunzea*, *Kunzea ambigua*), and many other plants with commercial application for forestry, essential oils, horticultural use, and food production.

With the notable exception of Taranaki, where it is scarce, kānuka is common in lowland and mountain scrub, and along forest margins in the North and South Islands. It grows from the Three Kings Islands to Kawarau Gorge and Dunedin in Otago. It is not found naturally in the very south of Te Wai Pounamu.

Kānuka species have a wide range of tolerances and can be found from sea level to 1800 m. They grow well on all soil types except water-logged soils, and are tolerant of wind, drought, and frost.

Kānuka is a Taonga Species

In Aotearoa, kānuka is a well-known plant, being prominent in successional shrublands and secondary forests, and especially prominent in highly erodible, marginal landscapes.

Kānuka are important keystone species, acting as pioneer species to colonize disrupted or damaged ecosystems, providing erosion mitigation, an important habitat for other organisms (for example endemic geckos and fungi), and enabling carbon sequestration.

Beyond their contribution to te taiao (the environment), kānuka are increasingly recognized for their contribution to human health (e.g., as a rongoā/remedy), and potential to generate income through supporting a range of products (e.g., essential oils, honey, herbs and beverages, firewood, timber, and smoking woodchips).

From a Te Ao Māori perspective, kānuka are an important taonga species, and we recognize the interconnectedness between kānuka and all the other elements of an ecosystem, as explained to us in our whakapapa.

For Māori, centuries of mātauranga about ways of observing and living with these species are handed down through the generations, and having these plants present in our landscapes enables us to reconnect with that knowledge.

What Can We Learn From Other Industries

The Australian Tea Tree Oil Industry

The Australian Tea Tree oil industry is Australia's largest essential oil export. It is a mature industry, producing around 900 tonnes of oil per year, and worth about \$35.32 million AUD. To achieve its current growth status, the industry has had 30 years of government investment in RD&E, including research partnerships with universities, and been led by an industry body for 25 years.

The Australian Tea Tree Industry Association Ltd (ATTIA) was formed in 1986 to build and drive the Australian Tea Tree oil industry. For 20 years it tried to convince producers to adopt a levy, and finally, in 2017, a Tea Tree oil levy was introduced on all oil produced and sold in Australia, as well as oil that is exported. The levy is charged at a set rate per kilogram of oil.

It took two decades for the tea tree oil industry to agree to a levy that funds R&D and the industry body.

90% of the Tea Tree oil produced in Australia is exported: 54% to North America, 30% Europe, and 14% to Asia. Despite being an established industry and having strong consumer recognition, 80% of all exports are oil in bulk form, with a small fraction utilised in value-add formats (e.g., cosmetics, pharmaceuticals, aromatherapeutic and veterinary products).

Early investment in scientific studies helped to raise the credibility of Tea Tree oil. ATTIA and AgriFutures Australia have played a significant role in the growth of the market, publishing data on the safety and effectiveness of Tea Tree oil, and funding in vitro research clinical studies to prove its efficacy as an antibacterial, antifungal, anti-viral and anti-inflammatory product.

Significant investment, including government support, has created a body of scientific literature that confirms tea tree oil as a bioactive ingredient.

ATTIA administers an industry website, produces regular communications via newsletters, and makes industry statistics and trade data available to the public. ATTIA membership gives access to various rights and permissions for use of the ATTIA logo on labeling, marketing content, and communications,

conveying industry standards of quality and consistency that are globally recognised. Members can be producers or non-producers (e.g., associate member, non-producer member, COP accredited ATTIA producer member).

An active industry body, and rigorous standards and certification, is critical to the success of the tea tree oil industry.

Even though *M. alternifolia* is native to Australia, it has been introduced to many other countries including China, South Africa, Kenya, Indonesia, and Thailand, where it grows well. Scientific studies suggest that Tea Tree oil has good antimicrobial efficacy despite its origins and that other factors such as extraction, harvesting, and storage methods are likely to also contribute to bioactivity. Building the reputation of Australian-sourced Tea Tree oil through traceability and quality assurance is the key strategy to remain competitive in the market.

By focusing on the chemical activity of *M. alternifolia* on microbes, rather than the provenance of the oil, the Australian Tea Tree oil industry has enabled other countries to capitalise on their efforts to build the market. In the American marketplace, Australian Tea Tree Oil commands a higher price (\$40 USD/kg in 2022) than oil sourced from Chinese plantations (\$28 USD/kg in 2022), but the price gap may well reduce as Chinese Tea Tree oil builds its own body of scientific validation.

Building a marketing strategy on science alone leaves the Australian tea tree oil vulnerable to competition from other countries.

The Indigenous voice is notably absent in the Australian Tea Tree oil industry. There is little reference to the Bundjalung people of eastern Australia as having used inhalation of the oil from crushed leaves to treat respiratory ailments, topical application of leaves on wounds as poultices, and brewed infusions of leaves as a tea for internal ailments. Having built a marketing story based solely on the components of the plant, it is difficult for the Australian Tea Tree Oil industry to retrofit a unique selling proposition into their branding that would distinguish their product from other countries.

A provenance marketing strategy based on the relationships between plant, place, and Indigenous Peoples, is a useful defensive move for protecting against competition from cheaper producers.

The Australian Kunzea Oil Industry

The Australian Kunzea oil industry is based on the Kunzea ambigua plant, indigenous to Australia, which is also known as Tick Bush. (*K. ambigua* and *K. ericoides*, or Kānuka, are both part of the Kunzea genus). Domestic production of Kunzea oil is reported to be 4-5 tonnes per year (\$1.6-2m AUD). The Australian market accounts for approximately \$0.5m AUD of sales, and most of the exports are as neat oil to North America.

Most Kunzea oil is produced in Tasmania, the geographic region where it naturally occurs at high concentrations. The current production relies mainly on wild harvest, although plantations are being established, and a project is currently underway to identify wild samples throughout Tasmania to identify superior cultivars for developing commercial plantations.

There is currently no dedicated Kunzea oil industry body, website, or collective industry profile (e.g., there are no industry newsletters, or regular conferences), and no trade data available over and above estimates published by research agency Coriolis in 2021. There are no standards or industry certifications for Kunzea oil, although key players understand that developing internationally recognized standards is critical to growing the market.

Without an industry body, the Kunzea oil industry will not be able to establish the necessary infrastructure, including certification.

As is the case with Tea Tree oil, the marketing of Kunzea oil has been built on its bioactive properties. There are a growing number of research publications that support claims of Kunzea oil as an insecticide. Most of the reported uses of Kunzea oil are as a topical treatment for skin and muscle inflammation, although there are few scientific publications regarding the anti-inflammatory activity of Kunzea oil.

Scientific publications on bioactivity are an important part of the strategy for building value in the Kunzea oil industry.

Given the alpha-pinene levels reported in Kunzea oil (ranging from 0.6-62.5%), this is likely to be the active compound, as alpha-pinene is well established to have anti-inflammatory activity. Because the alpha-pinene content of the *K. ambigua*

plant is highly variable, Kunzea oil will also feature highly variable levels, and this is a challenge the industry will need to address.

To develop an international standard for Kunzea oil, there will need to be careful attention paid to the levels of components specified (e.g., alpha-pinene is commonly found in many plants), and the development of consistent oil yields to achieve quality assurance. Thus, there are many challenges to be overcome for the Kunzea oil industry and it is early days for growing the market.

The New Zealand Mānuka Oil Industry

Mānuka oil is in a similar industry growth phase to Kunzea oil. The current production of Mānuka (*Leptospermum scoparium*) oil from Aotearoa is reported to be 10 tonnes per year, up from 4-5 tonnes per year just a few years earlier. Assuming Mānuka oil averages \$650 NZD per kg, this would suggest that the industry is currently worth around \$6.5 million NZD.

The medium-scale commercial production of Mānuka oil has been underway for around 20 years in Aotearoa, in parallel with the development of the Mānuka honey industry. In the last few years, plantations focused solely on Mānuka oil production have begun to emerge, suggesting that the Mānuka oil market is gaining momentum. While a number of international markets understand the Mānuka value proposition because of honey and have a high consumption of essential oils per capita, Mānuka oil is yet to achieve significant traction in those markets.

The Mānuka oil industry is at a similar stage to where the Australian Tea Tree oil was 25 years ago, with a strong need to address production dynamics and extraction efficiencies, along with quality standards and more investment in clinical trials. With no industry body and generating less than \$10 million NZD per year, Mānuka oil is still very much an emerging industry.

The lack of an industry body and collective activity in R&D and marketing means that the Mānuka oil industry has not grown in an equivalent way to the Mānuka honey industry.

Mānuka oil has been marketed as a natural antimicrobial against gram-positive bacteria (bacteria with simple cell walls and lacking an outer membrane), causing impetigo, blood poisoning, surgical wound infections, and flesh-eating diseases. This is due to the beta-triketones in Mānuka oil, and it has been reported that Mānuka oil is up to 30 times more effective

against antibiotic-resistant gram-positive bacteria than Australian Tea Tree oil.

Mānuka oil is listed under the New Zealand Inventory of chemicals (CAS 219828-87-2), ECHA (CAS 223749-44-8), and EINECS (425-630-7), however, there are no international standards or industry certifications in place. Significant research is required to understand how to develop standards that are robust and useful given the high chemotype variability. Until such time as an industry body forms to invest in RD&E on behalf of the industry, individual companies will continue to fund their own research.

Mānuka oil has a strong scientific proposition but will benefit from further research and a joined-up approach to R&D.

The high cost of production means that Mānuka oil is an expensive ingredient in cosmetics and other value-add products, and this restricts market growth (a kilogram of Australian Tea Tree oil retails for \$75 compared with \$650 for Mānuka oil). The strong aroma of Mānuka oil may limit its use in some products, but its potential as a natural alternative to conventional antimicrobials is likely to resonate with consumers. The ability to link this product to the premium-brand image of Mānuka honey should help to create trust in educated markets.

The New Zealand Mānuka Honey Industry

Mānuka honey is a major agricultural industry and a high-value product that attracts a significant retail premium. Honey exports from Aotearoa exceed \$350 million NZD per year, with Mānuka accounting for 70-75% of that value. Honeys from Aotearoa receive a price multiple at least seven times higher than other exporting countries. The quality, trustworthiness, brand power of Clean Green New Zealand, and the unique attributes of Mānuka honey itself have created this premium global market position.

Marketing underpinned by science is the key to achieving high value in the Mānuka honey industry.

There has been a shift from companies supplying bulk honey to selling packaged products under their own honey brands to capture more of the supply chain value. The government has identified that the honey industry of Aotearoa can add \$65m

in export earnings over the next 10 years. Currently, just 10% of total registered beekeepers in Aotearoa are export registered. Demand for Mānuka honey continues to outstrip supply.

The Mānuka honey industry was developed by a few major commercial companies on the back of early scientific research by the Waikato Honey Research Lab in 1984 that showed Mānuka honey had significant non-peroxide antimicrobial activity. Active Mānuka honey is sold under multiple quality standards like UMF, MGO, MGS, and OMA, a characteristic that quantifies the antimicrobial activity of honey over and above its peroxide activity.

Establishing a quality standard for Mānuka honey, backed by marketing investment, has been critical in achieving high returns.

As with Mānuka oil, Māori are over-represented at the lower end of the value chain, primarily as passive recipients (e.g., hive-site rentals). The current efforts to trademark the word 'mānuka' represent an attempt to improve the position of Māori in the industry by strengthening their relationship with a taonga species, as well as prevent Australia from competing for the same consumers. It has been proposed that an additional \$2.2 billion of value could be created by 2033 if the word and associated IP of 'Mānuka' honey is protected.

Ensuring leadership roles and economic opportunities for Māori in recognition of their kaitiaki relationship with mānuka and other taonga species is important in the early stages of industry development.

There is a high level of fragmentation and infighting within the Mānuka honey industry, and this prevents a single voice from emerging with a clear vision to articulate the potential of the industry. The existence of multiple quality standards (including UMF, MGO, MGS, and OMA) is confusing to the consumer and reflects a lack of a shared vision and agreed strategy for the industry. There is no national database or national communication strategy. In 2019, commercial beekeepers voted down the ApiNZ Commodity levy, which could have been invested in RD&E on behalf of the industry.

The Mānuka honey industry has been held back by the lack of an industry body and a levy to fund collective activities in R&D and marketing.

What Might a Kānuka Industry Look Like?

It is hard to overstate the importance of having a strategic approach to brand, product differentiation, and marketing strategy.

Having a strong industry body is essential to help overcome challenges that no individual company can afford to tackle alone, including the protection of purity, authenticity, and the overall state of the industry.

Some of the ways an industry body can help lift the overall profile of the industry are by fostering more collaboration and identifying agreed priorities, having more influence over Government and regulators, and a greater ability to enforce rules and stop fraudulent activity.

A provenance marketing strategy built on whakapapa – the relationship between Māori, the natural world, and the kānuka plant – will provide the kānuka industry with a strong branding and marketing proposition that defends against competition from similar oil industries in other countries.

Building a marketing story based on indigenous provenance stories led by Māori is a sensible strategy to future-proof the industry, and it avoids workarounds that occur when hero compounds (such as alpha-pinene) are sourced from alternative sources.

Investing in R&D will provide a strong underpinning for the kānuka industry, identifying the bioactivity of kānuka products and proving efficacy as an anti-inflammatory (as well as anti-bacterial).

Robust standards and traceability will reassure New Zealand and international customers that kānuka products made in Aotearoa are high-quality and trustworthy. It is critical to invest in RD&E to ensure consistency of kānuka product standards and deliver a certification system that gives consumers confidence and safeguards the industry against fraud.

It will be necessary to educate the market about the unique selling proposition of kānuka products.

To develop the kānuka product market and create a premium brand, it is critical that kānuka producers work collectively to develop standards, certification, and marketing information and messaging.

1. Hā Kānuka (National Entity)

Led by Māori and works on behalf of all kānuka producers in Aotearoa to invest in activities (IP protection, certification, standards, marketing, scientific research, and government liaison) that benefit the industry but are beyond the reach of any individual entity

2. Government

Provides funding for R&D and marketing through a formal relationship with Hā Kānuka, and establishes and monitors the regulatory regime for the kānuka industry

3. Analytica (and other commercial labs)

Provides commercial testing regime for kānuka products, using industry-accepted standards

4. Regional Extraction Hubs

Collectives that lead the establishment of regional kānuka industries and produce high-quality kānuka products

5. Individual Producers

Businesses that produce kānuka oil, honey, and dried leaf, as well as value-add products

What Are the Opportunities and Challenges?

Opportunities

Indigenous plant extracts from Aotearoa have social acceptance as food and medicinal products, and global demand for these is strong. Aotearoa is globally recognised as a source of pure and healthy ingredients and wellness products. Premium pricing for kānuka products is a realistic proposition.

There has been demonstrable growth in mānuka oil and related products on the back of COVID, and there is increasing global demand for new indigenous plant extracts. Global markets already understand the value proposition of mānuka honey, mānuka oil, and other indigenous plant products, and the pathway to market is clear and accessible for kānuka products.

There is scientific evidence that kānuka oil has anti-inflammatory and antimicrobial properties, and kānuka honey has immunostimulatory properties in vitro, and that topical medical-grade kānuka honey is an effective cold sores treatment. This is sufficient to feel confident that genuine kānuka products will perform well in the health and wellness sector.

A provenance marketing strategy based on whakapapa, that articulates the relationship between kānuka and Māori from the different regions of Aotearoa is an exciting proposition for positioning kānuka products in the crowded natural health marketplace.

Challenges

The market potential for kānuka products is limited by the lack of brand development and not having a coordinated marketing strategy. Unlike mānuka honey, which has been marketed as having special health-giving properties that make it a premium brand, there has been no similar brand development for kānuka products.

It will be challenging to educate the existing mānuka product market about the unique properties of kānuka products. The perception that kānuka is a lesser version of mānuka means that some customers may not be willing to pay a premium price.

The highly variable bioactive composition of kānuka products (e.g., oil chemical composition varies due to the genotype of individual trees, tree age, and environmental factors) means that care needs to be taken in any marketing based on specific chemotypes or percentages of compounds.

To develop the kānuka product market and create a premium brand, it is critical that kānuka producers work collectively to develop standards, certification, and marketing information and messaging. The continued fragmentation of the kānuka industry through individualistic behaviours is likely to erode efforts to create a strong, cohesive branding story.

The major component of kānuka oil, alpha-pinene, can be obtained more cheaply from other sources. It is dangerous to tie a marketing story to a single compound that is readily found in other plants (e.g., eucalyptus, rosemary, citrus, sage, as well as a variety of coniferous trees like European and North American pine trees).

