# Feasibility Study

## 2025

## A Detailed Report

**April 2025**

## Executive Summary

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## 1. Introduction

The "Glass ceiling" term is used to describe artificial barriers created by attitudinal and institutional biases that avert qualified individuals to reach to their maximum (Mattis, 2004). According to the UK The Bee Farmer's Association[1], UK produces around 14% of the honey consumed by the domestic market. This compares with European average of around 60%.

This is widely known that most of the pesticide spray are harmful in pollination and damage the immune system of the insects that are needed for cross pollination. To increase the pollination, one needs to reverse the pollinator decline. Bee farming industry, through the provision of managed and targeted pollination services, is in a unique position to help improve crop yield and increase productivity.

According to Houses of Parliament report posted in Sep 2013[2], Pollination by insects enables the reproduction of flowering plants and is critical to UK agriculture. The reports states, the number of bumblebees, solitary bee and hoverfly species in the UK, Netherlands and Belgium has generally declined since 1950. Two bumblebee species are thought extinct in the UK and eight have undergone severe range contractions (POST, 2013).

https://manukora.com/blogs/honey-guide/tagged/land-bees

## 2. Art of Ethical Bee Farming

### 2.1. Overview

There are four main pillars to ensure we are allowing the bees to live healthy, happy lives in their natural habitats[3]

1. We leave honey on the hivers for the bees to go through winter, which means the bees thrive s mother nature intended, so long as the weather is manageable, and no external support is needed

[1] https://beefarmers.co.uk/about-bee-farming/what-is-bee-farming
[2] https://researchbriefings.files.parliament.uk/documents/POST-PN-442/POST-PN-442.pdf
[3] https://manukora.com/blogs/honey-guide/the-art-of-ethical-beekeeping

2. No excessive hive transportation means our bees would never unsettle or shift to meet production needs. Hence the extraction process would be on the spot
3. We would ensure our bees have abundance of nectar and pollen in close proximity
4. Honey would be free of glyphosate, GMOs and antibiotics and ensure to keep it 100% raw

## 3. Manuka Tree

Manuka tree (Leptospermum scoparium) is New Zealand and Australia native tree that is famous for its flowers that are used to make Manuka Honey. The tree typically grows between seven and 16 feet tall, but some can grow up to 30 feet tall. They have hard, red wood, and evergreen leaves that are small and prickly, measuring around half an inch in size.

### 3.1. Resilience

Manuka tree has ability to survive in otherwise inhospitable areas, and they can withstand drought and frost once they are established. Another quality of this plant is that it prevents the soil erosion and provide the shade needed for slow growing native plants to establish.

### 3.2. Manuka Flowers

Manuka flowers bloom for two to six weeks each year during summer season and each bloom may only be open for around five days[4]. These sweet smelling white and pink flowers (refer Appendix 1) attract all kinds of pollinators, most notably, the honeybees responsible for the creation of Manuka honey.

Each tree produces limited amount of nectar, and it takes a lot of nectar to produce a small amount of honey. Bees need to visit thousands of flowers to gather enough nectar for just a small amount of honey. According to School of Bees[5], on average bees need to visit about two million flowers to produce 1 pound (approx. 454 grams) of honey.

### 3.3. Manuka Tree usage

Every part of the Manuka tree is useful including its wood bark, leaves and flowers.

#### 3.3.1. Manuka Wood and Bark

Manuka wood is hard, making it good for tools and housebuilding. Some people chew Manuka bark to support sleep or brew it in a decoction to aid joint heath. Manuka leaves

## 4. Leptospermum Scoparium

[4] https://manukora.com/blogs/honey-guide/manuka-tree
[5] https://schoolofbees.com/manuka-honey-the-complete-beginners-guide/

There are over 14 species of Manuka plants, seen in Annex 1. Manuka shrub typically grows to 2-5m tall, but can grow into moderately sized tree, up to 15m or so in height. It is evergreen with dense branching and small leaves 7-20mm long and 2-6mm wide.

According to theplantcompany.co.nz[6], best Leptospermum for hedging is 'Red Damask'. It is fast growing evergreen shrub with dense foliage and bright red flowers.

### 4.1. Hardy Leptospermum Scoparium

Leptospermum is a hardy plant that can tolerate different land conditions such as can grow in wetlands, coastal areas and lowland forests. Most species of Leptospermum tolerate the temperature as low as -12 Celsius. Leptospermums are also drought tolerant and can thrive in a poor soil. However, they will grow best in a well-drained soil with full sun or partial shade.

## 5. Manuka Honey

The best variety of Leptospermum Scoparium is also known as Manuka bush. Manuka honey contains an active ingredient called methylglyoxal (MGO), which has been suggested to have antibacterial effects. The higher the MGO level, the more potent the honey is. In addition to MGO, Manuka honey also contains vitamins, minerals, and amino acids. The properties make it a very versatile therapeutic agent.

NPA (non-Peroxide Activity) is an additional antibacterial factor found in Manuka honey, adding to its unique antiseptic properties. According to the research done in 2009, DHC (Dihydroxyacetone) by itself has no antibacterial characteristics, but it can be converted into GMO through a series of chemical reactions. In this way, the potential for MGO in Manuka honey can be estimated by evaluating DHA levels[7].

According to uk.steenshoney.com, Manuka honey is useful in digestion related issues such as IBS or ulcers etc[8]. It also helps in scratchy throats, infected sinuses and a rundown immune system.

### 5.1. Theoretical Honey per Acre

1 hectare = 2.47 acres land could produce 1 hive, and each hive could produce up to 60kg of honey. Market wholesale price of Manuka Honey is $66 per kilo that means total revenue expected is $3,960 per year per hectare. However, in controlled environment (such as green house) this number could increase to double. In natural climate the risks is extended rainy season during the flowering period that is barely 2 to 6 weeks in a year.

The returns could increase if the quality of MGO is sufficient to be a medical grade manuka honey, else would end up on the toasts. On the other side in 1 hectare of greenhouse could fetch well over $10,000 worth of vegetables each year, the likes of tomatoes etc.

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[6] https://www.theplantcompany.co.nz/shop/plants/latin/l/leptospermum-manuka
[7] https://melora.co.uk/blogs/news/what-is-the-best-grade-or-quality-of-manuka-honey
[8] https://uk.steenshoney.com/en-gcc/pages/targeted-range

### 5.2. Grading of Manuka Honey

The grading system for New Zealand Manuka honey is known as UMF (Unique Manuka Factor). UMF number on the label represents the amount of MGO in the bottle. The higher the UMF rating, the more antibacterial activity Manuka honey has, and the more potent it is.

*Figure 1: Manuka Honey Gradings*



UMF grading tests for four markers in Manuka including Methylglyoxal, NPA and Leptosperin. In UK almost half of the Manuka honey sold is not pure, according to Manuka Doctor website[9], there are no reliable figures on exactly how much honey falsely labelled as Manuka is sold in UK every year. But estimates based on New Zealand export figures suggest up to half of all honey sold as manuka may not contain what it claims on the jar.

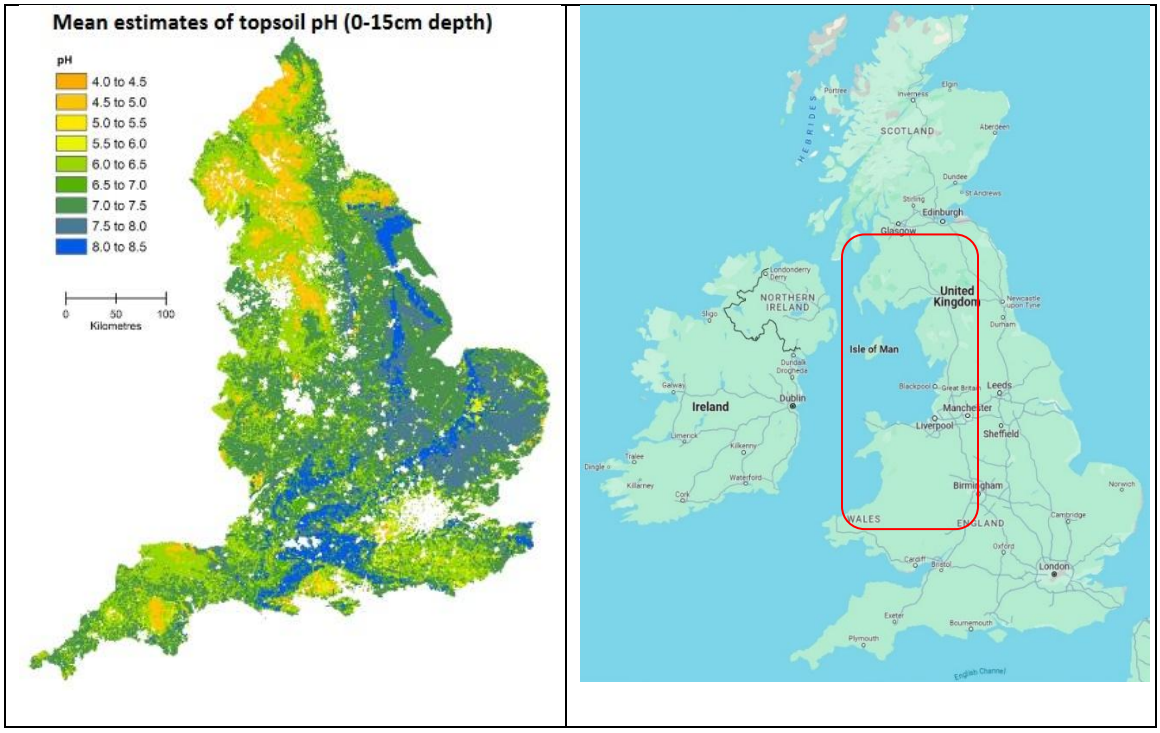
Antibacterial activity of Manuka honey and its components: An overview - PMC (nih.gov)

[9] 5 ways to check your Manuka Honey ISN'T fake - Manuka Doctor

## 6. Conducive Land Identification

According to survey conducted by UK CEH[10], the result is seen in Figure 1 (left hand side). Manuka requires pH level between 5.5 to 6.5, that's why the most probable site to grow the plants is seen in Figure 1 (right hand side). The soil Countryside Survey topsoil pH and bulk density (g-cm-3) data is representative of 0-15cm soil depth (Henrys, et al., 2012). The UK national Ecosystem Assessment (UKNEA 2011) recognises soil pH as a key component of natural capital for supporting ecosystem services, in particular nutrient cycling, as well as soil formation and primary production.

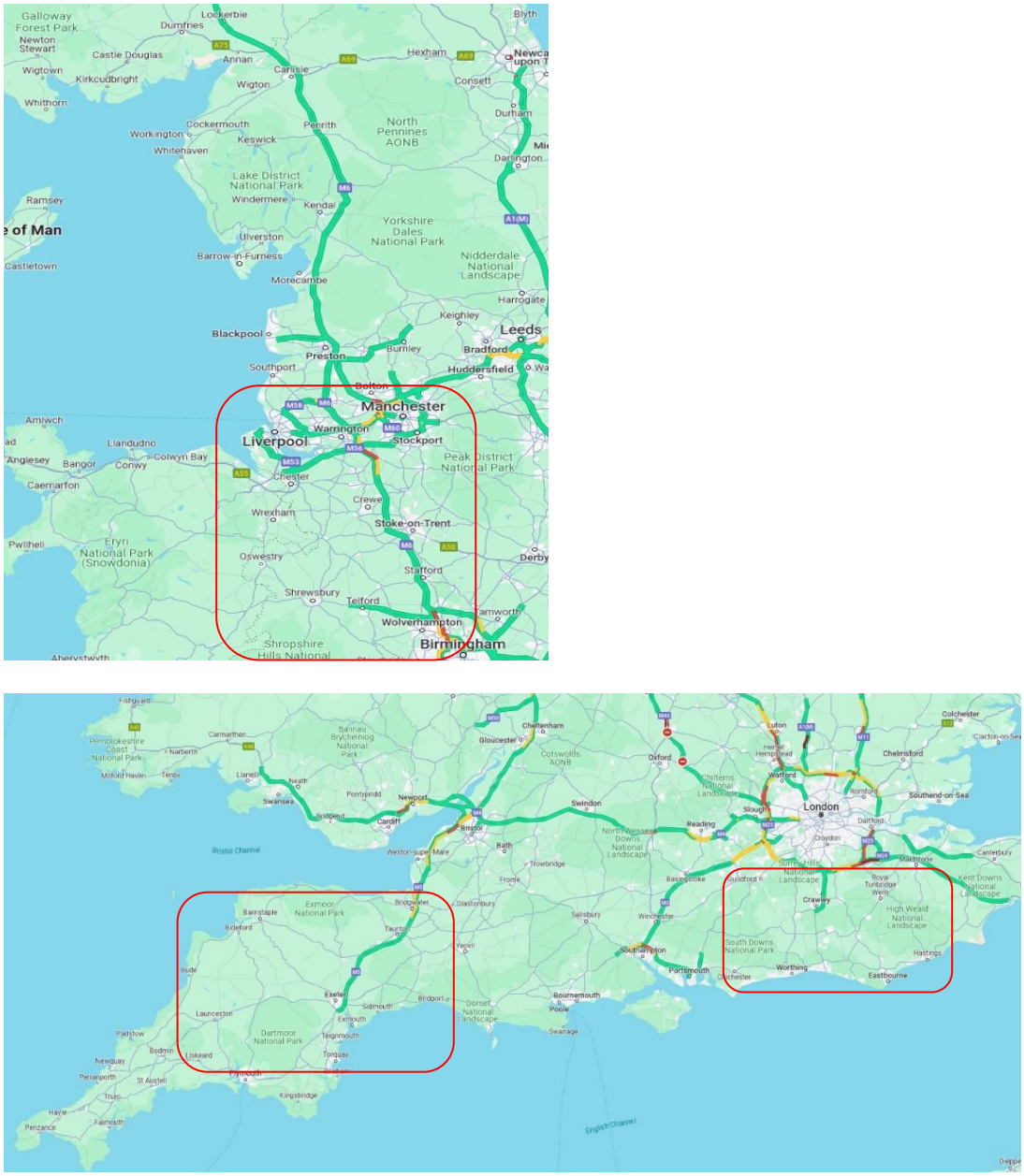
*Figure 2: UK Soil Survey*




[10] https://catalogue.ceh.ac.uk/documents/5dd624a9-55c9-4cc0-b366-d335991073c7

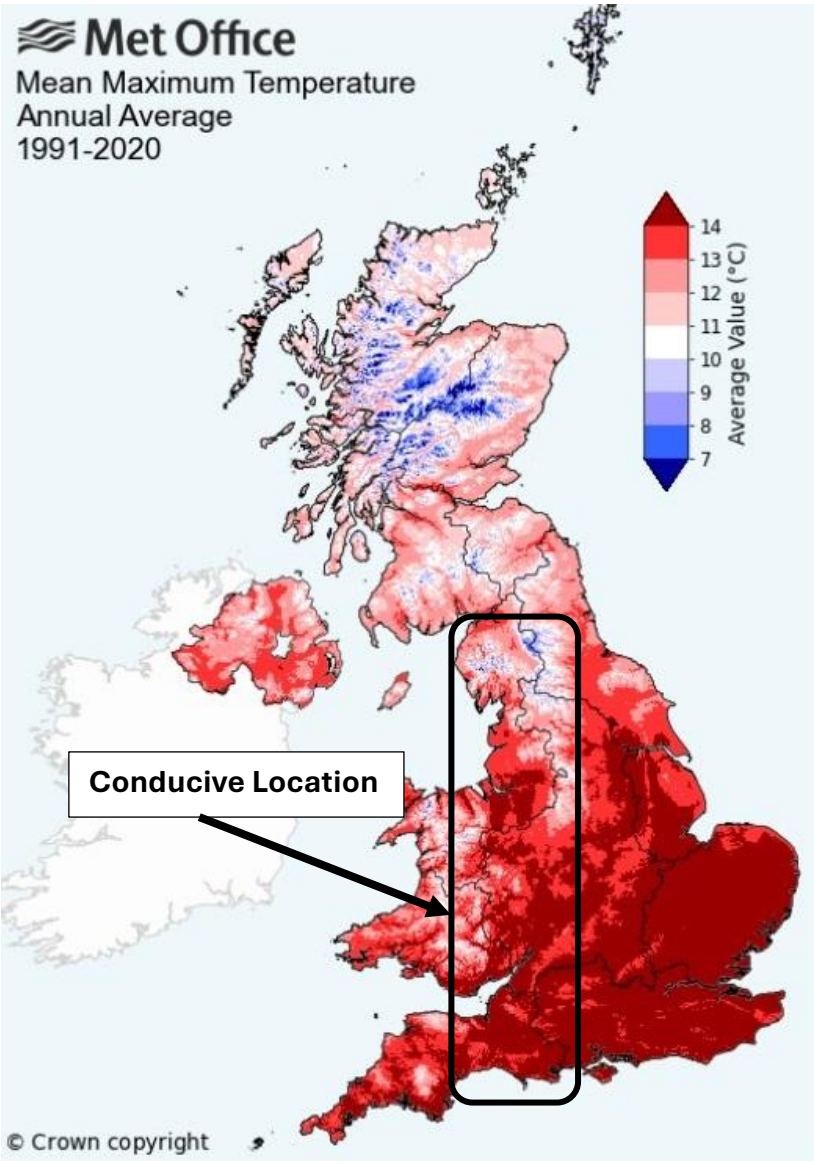
According to the soil report, higher pH is in East Anglia and lower pH in in upland areas in the Northwest. However, few scattered places in extreme south below London (on below mentioned map) and on the west between Exmoor National Park and Dartmoor National Park are conducive for Manuka faming.

*Figure 3: Low Alkaline with moderate Acidic soil*



Therefore, Manuka plant requires acidic soil over the alkaline and the most suitable land is seen in Figure 2, where the pH level is between 5-6.5. Although the plant is hardy but to protect in initial phase from cold winds and harsh frost, we would seek UK Met Office figures of past 30 years seen in Figure 3[11] and determine the best probable place for Manuka Farming.

*Figure 4: Met Office Avg Temperature 1991-2020*




[11] https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcpsvg3nc

https://www.quora.com/How-can-I-grow-a-manuka-tree

https://www.nurserykebunbandar.com/blogs/news/manuka-tree-1

https://www.gov.uk/guidance/hedgerow-management-rules-buffer-strips

Hedgerow management rules

https://static1.squarespace.com/static/5c354d3031d4df3e72d75662/t/5d13c25ace6df90001b66f94/1561576031236/Handbook+for+Manuka_web+version+final.pdf

https://www.nzffa.org.nz/farm-forestry-model/resource-centre/tree-grower-articles/may-2014/growing-manuka-for-farm-foresters-and-other-small-scale-foresters/

https://trc.govt.nz/assets/Documents/Guidelines/Land-infosheets/Manuka-plantation-guide-landcare-April2017.pdf

**7. Manuka Honey Extraction**

According to Manuka Honey[12] a normal beehive produces 35 kilograms of Manuka honey during the season. Around 95% of bees will forage within 6 km of their hive. Hive needs to be placed with large monospecific stands of manuka. Ideally, 1 hive is needs in every 5 acres of land.

Therefore, should we start the farming with 10 acres land would require to hives and expected to produce 50 kilograms to 70 kilograms of Manuka Honey.

In UK MGO250+ is being sold at £13 per 100grams.

DAWAAM produces 50kilograms or 50

[12] manuka-honey-industry.pdf (nzca.com)

survey conducted by UK CEH[13], the result is seen in Figure 1 (left hand side). Manuka requires pH

### 1.1. Goodwill

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[13] https://catalogue.ceh.ac.uk/documents/5dd624a9-55c9-4cc0-b366-d335991073c7

## 2. Conclusion

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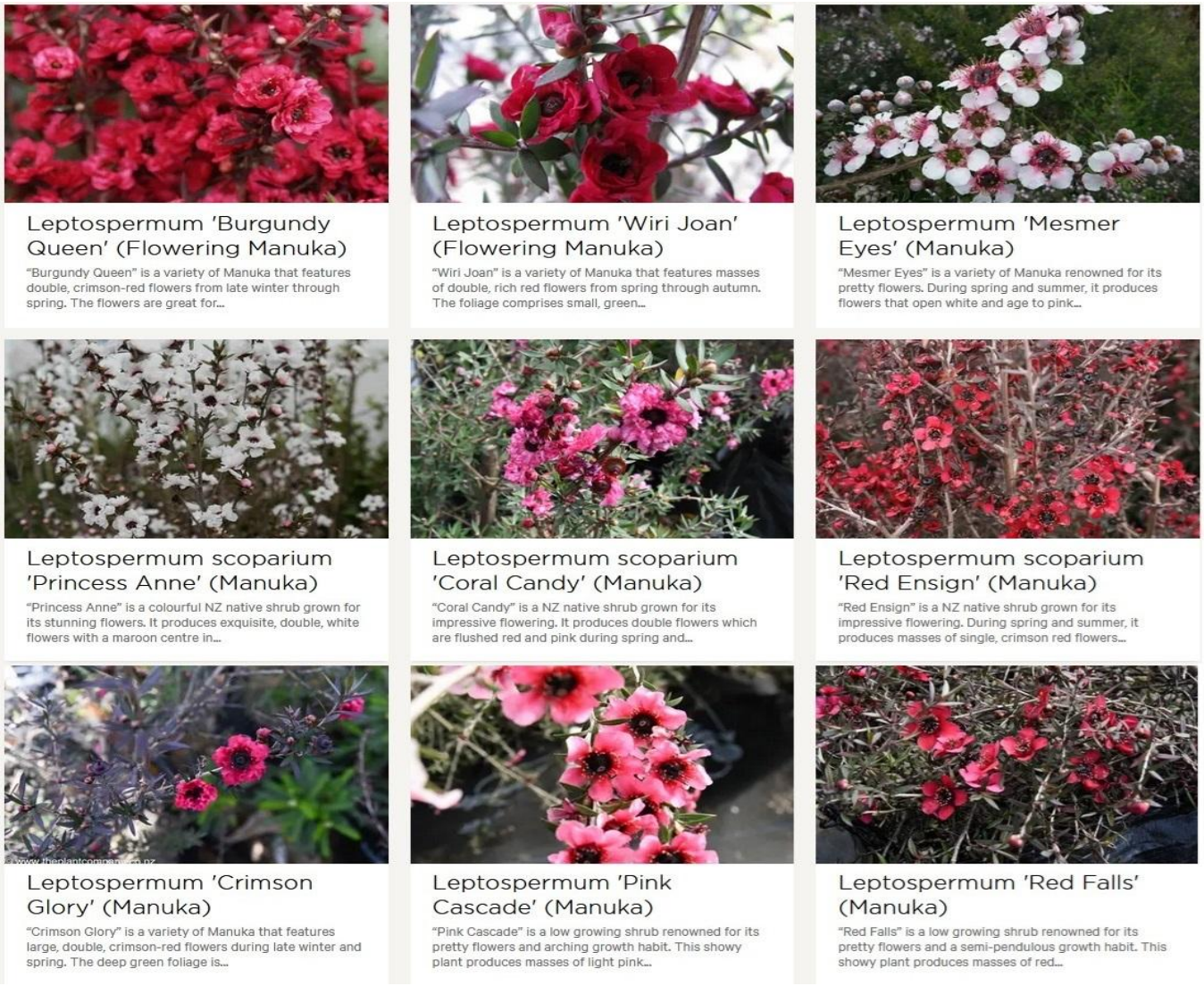
## Appendix I

Figure 5: Manuka Plants Varieties



Leptospermum 'Burgundy Queen' (Flowering Manuka)

"Burgundy Queen" is a variety of Manuka that features double, crimson-red flowers from late winter through spring. The flowers are great for...

Leptospermum 'Wiri Joan' (Flowering Manuka)

"Wiri Joan" is a variety of Manuka that features masses of double, rich red flowers from spring through autumn. The foliage comprises small, green...

Leptospermum 'Mesmer Eyes' (Manuka)

"Mesmer Eyes" is a variety of Manuka renowned for its pretty flowers. During spring and summer, it produces flowers that open white and age to pink...

Leptospermum scoparium 'Princess Anne' (Manuka)

"Princess Anne" is a colourful NZ native shrub grown for its stunning flowers. It produces exquisite, double, white flowers with a maroon centre in...

Leptospermum scoparium 'Coral Candy' (Manuka)

"Coral Candy" is a NZ native shrub grown for its impressive flowering. It produces double flowers which are flushed red and pink during spring and...

Leptospermum scoparium 'Red Ensign' (Manuka)

"Red Ensign" is a NZ native shrub grown for its impressive flowering. During spring and summer, it produces masses of single, crimson red flowers...

Leptospermum 'Crimson Glory' (Manuka)

"Crimson Glory" is a variety of Manuka that features large, double, crimson-red flowers during late winter and spring. The deep green foliage is...

Leptospermum 'Pink Cascade' (Manuka)

"Pink Cascade" is a low growing shrub renowned for its pretty flowers and arching growth habit. This showy plant produces masses of light pink...

Leptospermum 'Red Falls' (Manuka)

"Red Falls" is a low growing shrub renowned for its pretty flowers and a semi-pendulous growth habit. This showy plant produces masses of red...

Figure 6: Manuka Plants Varieties

Leptospermum 'Merinda' (Manuka)

"Merinda" is a variety of Manuka that grows as an open bush with a somewhat weeping growth habit. It bears masses of single, magenta-coloured...

Leptospermum 'Outrageous' (Manuka)

"Outrageous" is a variety of Manuka renowned for its pretty flowers. During spring and summer, it produces single, pink flowers with a green centre...

Leptospermum 'Blossom Queen' (Manuka)

"Blossom Queen" is a fast growing, NZ native shrub that produces stunning flowers. Double, pink flowers are borne in such proliferation they coat...

Leptospermum scoparium (Manuka)

Commonly known as Manuka, this is a fast growing, NZ native shrub that produces masses of white flowers in spring and summer. The flowers are...


Leptospermum nitidum 'Copper Sheen' (Shining Tea Tree)

"Copper Sheen" is an Australian native that bears both attractive foliage and flowers. The leaves are small, copper coloured, and produced on...

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# Bibliography

Henrys, P., A.M., Robinson, D. & Emmett, B., 2012. *Model Estimates of topsoil pH and bulk density,* s.l.: Environmental Information Data Centre - UK.

Mattis, M., 2004. Women enterpreneurs: out from under the glass ceiling. *Women in Management Review,* 3(19), pp. 153-163.

POST, 2013. *Reversing Insect Pollinator Decline,* London: Parliamentary Office of Science & Technology.