

Nectar and Pollen Sources of New Zealand

by R.S. Walsh

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together with a list of suitable source trees for planting in various districts and a chapter on the function of the flower.

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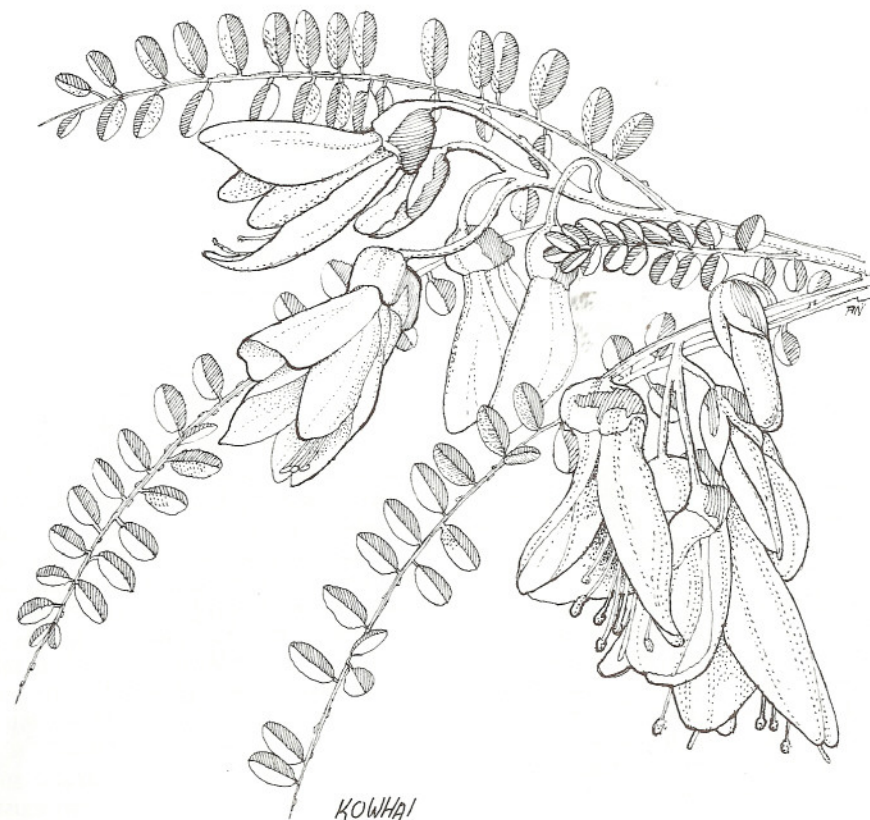
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INTRODUCTION

This appeared as a preface to the first edition of "Nectar and Pollen Sources of New Zealand."

So numerous are the sources of nectar and pollen to be found in New Zealand that it would be an almost impossible task to give a description of all of them. However, to compile such a list would serve no useful purpose as the yields from some sources are so slight that

they are of little economic importance, while plants that would yield appreciable quantities of nectar if sufficiently numerous are in many cases now so scattered and decimated by the encroachment of civilisation, the ravages of disease, fire and drought that they

contribute little to the beekeeper of today. There are a number of great forest trees that at one time must have been valuable sources of nectar had bees been kept within flight range.

The writer has no knowledge of the honey yielded by the flowers of many of these trees but has, on rare occasions when a convenient vantage point has allowed the opportunity of looking into their foliage high above the ground observed the bees freely working the nectaries of the flowers. Much of the pollen collected by bees kept in apiaries near bush areas is very difficult to identify.

Were it possible to index the variety of pollen in one colour range alone — that between white and deep yellow — it would present an imposing list. Outstanding colours observed in the corbucula of the pollen gatherers are snow white, black, bright red, bright blue, green, wine, orange, mauve, purple and brown. The pollen colours recorded here are as observed in the pollen baskets of the bee.

The principal nectar sources of the Auckland Province are today mainly the same as those relied upon by beekeepers elsewhere in New Zealand. However, the presence of manuka and bush honeys may be detected in the greater proportion of crops produced in North Auckland, the district with which the writer has been most closely associated. He has, however in addition, been associated with beekeeping in Canterbury, Taranaki, Poverty Bay, Waikato and Thames districts and has also been a honey grader for 13 years. This experience has enabled the writer to familiarise himself with the major and minor nectar sources of the Dominion.

The periods stated in which native plants flower yield nectar can only be given approximately for any named area as there is a considerable fluctuation between seasons and locations. Coastal areas are always some weeks

ahead of inland districts and some inland locations well south are more forward than northern districts that have every appearance of being more favourably situated.

As a result of observation and the compiling of records over a period of years the writer believes the ideal conditions necessary for a really good honey season in Auckland and North Auckland requires heavy winter rains until late September. The next two months should be without wind as wind almost entirely curtails nectar secretion.

Warm weather is, of course, necessary as are some periods of rain which should not, however, be accompanied by extremes in temperature. If the above conditions prevail up until the middle of November a prolonged drought will have no effect on crop returns. I am inclined to believe that drought conditions following ideal spring and early summer weather favour long and copious nectar secretion from all sources in this district. Unseasonal weather and a light honey flow will produce more delicate flavoured honeys of lighter colour. With a few notable exceptions, honey gathered from tree sources is denser than that of ground flora and takes longer to granulate.

There are a few areas in Northland and elsewhere where a pollen dearth exists for a short period. This is overcome by professional apiaries bringing combs of pollen from hives situated in more favoured areas, or by feeding a pollen supplement. Garden flowers are usually despised as being valueless to large scale producers, but as a source of pollen supply the writer is of the opinion it would be well worthwhile to sow half an acre or so in flowers adjacent to apiaries in pollen deficient areas. Peony Roses (*Paeonia* spp. *Ranunculaceae*) and wallflowers (*Cheiranthus* spp. *Cruciferae*) are two kinds of flowers that are heavy pollen producers and very attractive to bees over a long period.



RATA VINE

WINTER SOURCES OF NECTAR AND POLLEN

Strawberry Clover (*Trifolium fragiferum*).

This is another late flowering clover that assists colonies in this district. It is in full bloom in April and favours swampy locations and saline soils. The flowers are pale pink and the seed heads have a strawberry appearance, hence the name strawberry clover. The honey is white and of delicate flavour, but is rather light bodied.

Houhere (*Hoheria populnea*).

A small forest tree, up to 12 m high, also known as lacebark, yielding abundance of nectar mainly in May. The flowers are white and star shaped and bloom in such profusion that the leaves are frequently concealed. In favourable seasons, and May is generally a good month for nectar gathering in Auckland, the bees obtain a surplus from this source. Flowering period extends from March until May. The honey is medium amber in colour with a strong but not unpleasant flavour. It is light bodied and if the cap-pings are bruised runs very freely.

Mountain Ribbon Wood (*Hoheria lyal-lii*).

Found mainly in upland districts of the South Island, yields a dark nectar in the autumn. Grows to 8 m.

Mangrove (*Acvicennia resinifera*).

Known to the Maoris of the North as Manawa, is a good source of late pollen which the bees gather in May and June, the normal flowering period as far south as Opotiki. However, I have seen it in bloom in October when the bees were gathering its dull greenish yellow pollen. In the extreme north the mangrove flowers in some seasons in April and continues until the end of June. During the seasons of early flowering the bees work the flowers for nectar. The honey has a most unpalatable flavour, reminding one of fermenting liquor. It is light amber in colour, light bodied and is

given to soft granulation. Grows to 8 m.

Brush Wattle (*Albizzia lophantha*).

A small tree with spreading branches. The young branchlets and leaves are covered closely with soft hairs or down (*pubescent*), the flowers are yellow and in axillary racemes. Found in waste places and forest margins in the Auckland Province, in areas where the plant is plentiful surplus honey can be taken from hives. It yields from late May until early August. The honey is water-white in colour and of excellent body. The flavour is reminiscent of rape honey.

Spiny Hakea (*Hakea acicularis*).

Originally a hedge plant that has thrived to such good purpose in Auckland that it grows profusely on wasteland over a wide area. It is also found in South Auckland where it appears to do as well as in the north if allowed the opportunity. Spiny hakea flowers from June until September. Its flowers are very minute, but are worked freely by the bees for both nectar and pollen which is light yellow or mustard in colour. Northern apiarists who extract early in the season are harvesting increasing quantities of this honey. It is of light amber colour and mild flavour; when tasted green in the combs it has a peppery flavour that can easily cause a bout of coughing.

Kohekohe (*Dysoxylum spectabile*).

Also known as native cedar kohekohe attains a height of 17 m. The glossy pinnate leaves consist of about four pairs of leaflets, 5 cm to 15 cm long. The long branched and pendulous flower stalks with the large white lily of the valley-like blossoms spring from the bare parts of the trunk and branches. The flowers are waxy in appearance. The nectar is water white, but the honey is unlikely ever to be extracted as the tree is in bloom between May and late July. Restricted to the North Island.

Parapara (*Heimerliodendron brunonianum*).

A small tree up to 10 m in height. The leaves are opposite and 10 to 40 cm long. The flower panicles are hairy, 4 cm to 10 cm across, green in colour. The flowers appear to be present throughout the year in this district. Bees are sometimes found adhering to the sticky fruit of the tree. They collect a pale yellow pollen from this source. Confined to the North Island.

Maire Tawake (*Eugenia maire*).

This Maire reaches a height of 15 m in favourable damp localities. This tree is conspicuous because of its smooth white bark. It flowers in terminal, many flowered, short, flat topped panicles. The flowers are white and the fruit large red edible berries. The blooming period extends from June until August and bees eagerly visit the blossoms during suitable weather. The nectar is clear and very light in colour. The pollen is a dirty dull white. Found throughout the North Island and north of the South Island.

Pink Heath (*Erica baccans*).

A native of South Africa — is found in small isolated patches in a number of North Auckland districts, parts of the Waikato and Great Barrier Island, but grows in quantity only in the Te Kopuru district of Dargaville. It flowers early in June and is yielding lightly by the end of the month and is at its height during July and August.

Unless a beekeeper has had some experience with bees on the heath he may lose more than he gains as there are a number of unusual problems to overcome. In order to gain full advantage from this undoubtedly valuable winter flow the hives must be well supplied with pollen for once the pollen in the hives is exhausted breeding comes to a standstill and colony strength dwindles rapidly, as the heath itself is a poor pollen bearing plant, yielding only

a slight amount of grey plasticine-like pollen of poor quality.

As an experiment, the rearing of queens was attempted on one occasion and 60 per cent of the cells grafted were accepted and the virgins successfully mated. The queens proved themselves the following summer to be the equal of those raised in the spring, but the hives in which they were reared were completely ruined.

Heath honey is medium amber in colour and has a flavour suggestive of well cooked marmalade. It is easily extracted and remains liquid for a long period. Its keeping qualities are excellent. Hives expertly prepared average a 25 kg surplus. A limited quantity of heath honey has reached the market and has been favourably received.

Spanish Heath (*Erica lusitanica*).

Similar to tree heath (*E. arborea*), but more strictly erect in habit. The leaves are rather irregularly arranged. The flowers, corolla white to rosy, stamens and stigmas deep pink, are in clusters at the ends of the twigs. Found in both islands. Spanish Heath flowers most of the winter and is a useful source of nectar. The honey is medium amber and rather strongly flavoured.

Tree Lucerne (*Cytisus proliferus*).

Commonly known as Tagasaste, used as a rapidly growing hedge plant attaining a height of up to 7 m. The blooms are produced in profusion along the stems of the previous year's growth and are creamy white in colour. In the Auckland and North Auckland districts, tree lucerne comes into flower in June and remains in bloom until September.

This is a valuable bee plant in the South Island, but in the Auckland district results in too much stimulation with the result that queens begin laying and large numbers of out of season bees are produced with consequent heavy inroads into the stores of colonies. Tree lucerne

in this district is subject to tree borer which considerably shortens the life of the trees. When the trees are grown as a hedge plant and kept cut, flowering is delayed for a number of weeks. A good supply of deep but dull creamy yellow pollen is obtained from tree lucerne. The honey is white in colour and mild flavoured.

Puriri (*Vitex lucens*).

Grows to 20 m and has dull red flowers in spikes almost the year round. The only mention I have read of this tree as being of value to the beekeeper was in a manual out of print wherein it was stated that the puriri was worked freely by the bees for nectar.

The author was probably misled by the abundance of nectar to be found in the flowers at all times and his having observed the bees visiting the flowers for pollen. Bees gather pollen freely during the months of June and July. The pollen is pale green in colour. The bees are not attracted by the nectar of the Puriri as the sugar concentration of the nectar is very low and remains in almost the same condition throughout the year. However, if humidity remains low enough, for long enough, the nectar may attract bees. Northland to Gisborne.

Kowhai (*Sophora microphylla* — throughout New Zealand and the Chathams and — *S. tetraptera* — middle of the North Island).

One of the best known native early flowering trees. In Auckland frequently attains a height of 12 m. The flowers, which are large and golden yellow, burst into flower before the appearance of the leaves. Birds compete with the bees for the copious quantities of nectar yielded by the Kowhai between late July and October, according to locality.

The nectar is secured when the flowers begin to droop, and when the flowers age, causing the petals to shrink in slightly from the calyx. A surplus is

occasionally obtained from this source, the honey being low light amber with a mild but distinctive flavour. The pollen is deep orange and although covering the bodies of the bees during their foraging for nectar it is seldom observed packed in the pollen baskets of the bees. Found in the North and South Islands.

Manuka (*Leptospermum scoparium*).

There are some 35 species of manuka, mostly belonging to Australia and three to New Zealand. The New Zealand species are to be found throughout Northland, and most of New Zealand, covering huge areas particularly gumland.

Hybrid varieties of all three species may be found growing in areas occupied by one or all the parent strains from which they originate. *L. scoparium* is known to beekeepers as red tea trees, although the flowers are white. It is from the red wood that it derives its name. The red flowering Manuka is also red wooded but is found only in large areas north of Whangarei. Both these species of manuka yield some nectar in June and July. A surplus is seldom gathered at this time but, like the Tree Lucerne, stimulates colonies with resultant breeding and heavy consumption of stores.

The main flow from Manuka may occur in September in coastal areas near Auckland and as late as November in parts of the Whangarei district. Tea trees will secrete nectar under almost any conditions except during a period of cold winds. Manuka honey varies a good deal both in flavour and consistency, being influenced apparently by soil types, weather conditions and the intensity of the honey flow. Honey of this class produced on rolling limestone country is noticeably of milder flavour, lighter in colour and more inclined to leave the combs during extraction. Southern manuka lacks the thixotropicity of the northern species. Manuka is a fair source of pollen of a muddy white colour.



**TREE SOURCES
OF SPRING POLLEN**

Wattle (*acacia*).

Wattles, of which there are over 750 species, are valuable sources of pollen and a few contribute nectar. Of the species growing in New Zealand, some will be found to be in flower at all times of the year. The Australian blackwood (*Acacia melanoxylon*) is invaluable as a spring pollen source. The Black Wattle (*Acacia decurrens*), flowers from June onwards. The Cootamundra (*Acacia baileyana*), flowers in July and produces pollen so profusely that it litters the ground.

Other common varieties include Silvery Wattle (*Acacia dealbata*), Hedge Acacia (*A. armata*), Prickly Leaved Hedge Acacia (*A. verticillata*), Sunshine Wattle (*A. discolor*) and Golden Wattle (*A. pycnantha*) which yields nectar in July, August and September from extra floral nectares at the base of the leaves.

Wattle pollen ranges from dull to bright yellow. The Coastal Wattle (*A. longifolia* variety *sophorae*) also yields leaf nectar and surplus honey and is at times harvested from this source in the Warkworth district. The honey is extra light amber in colour and a mild to delicate flavour.

Kauri (*Agathis australis*).

The flower cones are visited for pollen by bees from September to October. Male and female flowers are produced in separate cones on the same tree. The white pollen is gathered from the male catkins.

Kawaka (*Libocedrus plumosa*).

White pollen is available from September

to October from the male catkins which are borne at the tips of the branchlets.

Miro (*Podocarpus ferrugineus*).

The male and female flowers are produced on separate trees of the Miro. They are visited by bees from September to October for a whitish pollen.

Totara (*Podocarpus totara*).

Pollen from Totara is white and very attractive to bees from September to October.

Matai (*Podocarpus spicatus*).

A similar tree to the Totara, yielding a white pollen in October and November.

Kahikatea (*Dacrydium dacrydioides*).

A very lofty pine bearing tiny catkins on the tips of its branchlets in September and October. The bees gather a white pollen from the buds during this period.

Rimu (*Dacrydium cupressinum*).

The male flowers are produced in inconspicuous green catkins at the end of erect branches. The females are solitary at the tip of curved branchlets. Worked for white pollen in September and October.

Radiata Pine and other introduced pines offer copious supplies of yellow-brown pollen during the spring months. However, the pollen is dry and light and appears to have little attraction for bees except on rare occasions when little other pollen is available.



**SPRING AND SUMMER
NECTAR SOURCES**

Five Finger (*Pseudopanax arboreus*).

Known to the Maori as Whauhau, five finger is a small tree growing in abundance at the fringe of bush areas throughout New Zealand. The leaflets are tough, roughly toothed, in clusters of five, and 10 cm to 15 cm long. The flowers are fragrant, green, borne in terminal umbels, and bloom from July until the end of September.

This plant is a reliable source of spring nectar, sometimes yielding prolifically. On one occasion I saw a number of hives treated for disease, having only foundation, build comb and store a surplus of honey from this source. The honey is in the top light amber class, but the flavour is marked by a bitter oily after-taste.

Cultivated Fruits.

It is pointless to discuss to any extent the value of orchard areas to beekeepers in this district. My experience has convinced me that they are next to useless. I have too often found colonies of bees starving in, or adjacent to, orchards containing fruit trees of many varieties in full bloom. I will, however, endeavour to describe some features connected with fruit bloom that have attracted my attention.

First, there can be no doubt that the orchardist receives all the benefits by way of pollination services from colonies located in, or within flight range of his fruit trees. On occasion, the beekeeper suffers considerable loss in the destruction of his bees by spray poisoning.

I know of no source of nectar, slight as it is, governed to a greater extent by weather conditions in respect to secretion. Early blooming fruit trees are of no assistance in maintaining bee colonies, but do stimulate, (which could be disastrous), and supply some pollen.

Late flowering apples are of some value and I have observed nectar stored from

this source in the South Island. Cherries are on about a par with late apples, and if a sufficient area of cherry trees can be found it may perhaps be worthless locating an apiary near them.

Fruit trees are a source of pollen, particularly pears, but in this district much superior sources can be found elsewhere. Apple and pear pollen is greenish yellow and plums a brownish shade. No doubt low sugar concentration of the nectar in this district is a disadvantage. However, reports from other districts do not give much credit to fruit trees as a source of nectar.

Citrus groves, which are undoubtedly valuable in some countries, do yield a little nectar to bees in the Auckland Province and are a good pollen source.

A pure sample of this honey received from Raratonga, recorded 45 colour points on the PFUND grading machine (medium amber). The flavour was pleasant with a slight bitter after-taste. The honey remained liquid for five months and was particularly bright and clear. A portion to which starter was added granulated in a normal manner.

Arum Lily (*Zantedeschia aethiopica*).

This is an early source of waxy white pollen. Bees eagerly visit these lilies from August onwards when pollen is in short supply, recovering the sticky white pollen from the yellow spadix of the flower.

Speedwell (*Veronica Arvensis*).

A field Veronica common in fields and waste places. It is an annual with trailing stems about 15 cm long. The flowers are small and blue and bloom profusely in August and September.

Bees undoubtedly obtain a good deal of honey from this plant as they are found on it in large numbers during the flowering period which coincides with fruit bloom and is always more attractive to bees than is fruit blossom nectar.

Trailing St John' Wort (*Hypericum Humifusum*).

Favouring clay soil, the stems are numerous, 9 cm to 25 cm long. The flowers are yellow, 1 cm in diameter and the leaves bluntly pointed, bluish green and 7.5 mm long. Produces a plentiful supply of orange coloured pollen in August and September.

Rangiora (*Brachyglottis repanda*).

This is a small bushy tree up to 7 m high, the branches densely clothed in white tomentum. The leaves are dull green above, white beneath, 5 cm to 25 cm long. The flower panicles are drooping, usually terminal, numerous, cream coloured and fragrant, blooming from August to October.

The honey is light amber and of good flavour, but of light body and always consumed in brood rearing. The bees gather honey dew from the trunk of the trees in February in some seasons. This tree is confined to the North Island.

Cape Weed (*Cryptostemma calendula*).

An introduced weed not unlike the dandelion in appearance but with a larger flower. Cape weed is capable of providing the bees with surplus honey in some districts, but in most districts is of value only in maintaining hive strength prior to the main flow. The honey is light amber in colour, mild in flavour, with a naturally coarse grain.

As a pollen plant Cape weed has few superiors among pasture plants. The pollen is bright orange in colour. Widely spread in the North Island and some local areas in the South Island.

The flowers first appear in August.

Tasmanian Blue Gum (*Eucalyptus globulus*).

Grows to 100 m and is a native of Tasmania and a distinctive species with large sickle shaped leaves, and fruit, up

to 25 mm in diameter. Blue Gum is not a reliable honey plant and seldom yields under dry and windy conditions. Blue Gum flowers in spring. The honey is medium amber, rather light bodied, cloudy and slow to granulate. The flavour is suggestive of muscatel grapes. Gums in New Zealand generally are only a fair source of pollen which is always pale yellow or creamy to white in colour.

The Crimson Rata Vine (*Metrosideros carminea*).

A tall climber extending from Manganui to Taranaki. The leaves are egg shaped with a reddish hue on the underside. The flowers are small and bright carmine, flowers from August to October. The honey is light amber, light bodied and mild flavour. The pollen is yellow.

Akepiro (*Olearia furfuracea*).

A shrub-like tree up to 5 m in height. The branches are velvety and twigs grooved. The leaves are 5 cm to 10 cm long, obtuse, stiff, occasionally obscurely toothed, silverly tomentose beneath. Flowers white, in large heads, blooms August to October. A splendid source of yellow coloured pollen. Confined to the North Island and replaced in the south by other similar species of *Olearia*.

Koru (*Pratia physaloides*).

A shrub up to 1 m in height. The leaves are alternate, membranous, ovate with petioles up to 10 cm long. The flowers are distinctly blue in racemes of six to 12. A very useful source of white coloured pollen during Spring. Grows in the northern part of the North Island.

Willow Herb (*Epilobium spp.*).

A native wood or herb with willow like leaves. The flowers are in axillary or terminal spikes or racemes. The flowers are comparatively large, having four petals either white or pink. The plant appears to favour damp places such as ditches but is often found in drier loca-

tions. The flowering period is extended, commencing in September. Pollen gathered from this source has a bluish tint. The honey is white in colour, heavy bodied and is sweet without any characteristic flavour.

Shepherds Purse (*Capsella bursa-pastoris*).

An annual weed found both on cultivated land and in waste places. The leaves are dull green, long, broad and slightly indented on the edges, and lie flat upon the ground. The flower stalks often much branched, are round, stiff and carry small leaves, and are up to .6 m in height, bearing small white flowers in clusters at the top. The plant blooms in early spring and sometimes continues until the beginning of winter. The bees obtain a thin pale nectar from this source which is of assistance during the dearth periods.

Hange Hange or Pigwood (*Geniostoma ligustrifolium*).

A small shrub up to 3 m high with shining pale green leaves 4 cm to 7 cm long. The flowers are small and greenish and grow in great abundance. Their scent is very strong and resembles that of a pig sty. The honey is extra light amber and tastes as it smells.

It is a reliable spring nectar source and in some years produces up to two supers of honey. The pollen is greenish yellow. Plentiful in the North Island and Marlborough. The flowering period is August to October, according to locality.

Clematis (*Clematis paniculata*).

Known to the Maoris as Pikiarero, a beautiful climber with thick and glossy leaves. The blossoms are interesting in that they have no true petals, the white star-like parts being really seven sepals. There is no doubt the clematis makes some contribution to the hive as the bees work it for a very pale nectar from August to October.

Buttercups (*Ranunculus spp.*).

There are a number of species of buttercup and all the common ones favour wet conditions. The deep green serrated leaves and bright yellow flowers are familiar to everyone. This is a valuable honey and pollen plant.

The honey is dark, in the medium to dark amber class, but possesses a pleasant mild flavour which blends well with other honeys. The Maori name is Waoriki. Bees do not appear to work buttercup to any extent during the early flowering stage which is from August onward in this district. One species, a water plant, produces a honey with a distinctly burnt flavour. The pollen is yellow and very helpful during dearth periods.

Wood Sorrel (*Oxalis cernua*).

A common weed in the north and is plentiful in every orchard. The plant grows about 10 cm high, the leaves are clover-like, and the light yellow flowers are borne in bunches. The flowering period is August to October. Bees work the blossoms for nectar.

Bush Lawyer (*Rubus cissoides*).

Tataramoa is a lofty climbing vine up to 15 m in length. The flowers are white, pink or yellowish, plentifully produced in slender panicles and are very fragrant. Tataramoa flowers during August, September and October, and yields a thin water white nectar and a pale greenish pollen. The fruit are red or orange and the leaves are lance-shaped. Another slightly later flowering lawyer is *Rubus australis* which has yellow fruit and round leaves, and provides the bees with a similar nectar and pollen.

Flowering Currant (*Ribes glutinosum*).

An erect growing deciduous shrub with tri-foliolate currant-like leaves, strongly pungent and during spring, pendant racemes 10 to 15 cms long of rosy pink flowers are produced from each flower

bud on the stems. The flowers appear between August and October and are eagerly worked by bees.

The honey is white, and possesses a delicate flavour. The pollen is sticky and pale greenish white in colour. Found in localised areas in both Islands.

Mangeao (*Litsea calicaris*).

A small tree of the laurel family attaining 10 m to 15 m in height. The leaves are alternate, 10 cm to 15 cm long, pale brown when young. The flowers are cream delicate and fragrant growing four to five together. This is a good honey plant in spring, flowering August to early November. The honey is light amber and medium flavour. Confined to the North Island.

Tarata (*Pittosporum eugenioides*).

Lemonwood is a beautiful white barked tree up to 12 m in height with pale green undulate leaves on whitish twigs, and with large flat topped umbels of fragrant greenish yellow small flowers. The compact mass of flowers appears from August to early November.

This is a great nectar and pollen bearing plant. The honey is extra light amber, of fine grain and good body while the pollen is pale yellow. North and South Island.

Wharangi (*Melicope ternata*).

A small bushy tree 4 m to 6 m high with smooth grey bark from which bees gather a gummy propolis. The leaves are shiny and yellowish green 7 cm to 10 cm long and the flowers small and green in axillary panicles about 2 to 3 cm long. The flowers are in bloom from August to November when the bees gather a honey that is dark and rather acid in flavour. This tree is found as far south as Kaikoura.

Horipito (*Pseudowintera axillaris*).

Sometimes called the pepper tree and grows to 8 m high. This is a small ever-

green tree with blackish bark and glossy alternate leaves. The flowers are small, yellowish green and are produced in the axils of the leaves. The flowering period is August to December. This tree is a good minor honey source producing a dark amber honey of fair flavour but light body. Found in the North and South Islands.

Patotara (*Cyathodes fraseri*).

Bronze Heath is a member of the heath family. A 15 cm high erect or prostrate straggling plant with close set leaves having a thorn like tip. The flowers are white and bell shaped and large in proportion to the rest of the plant. The fruit is a small orange drupe. Extremely abundant in all dry situations throughout New Zealand.

Yields greenish nectar of a medium amber colour copiously. The flavour of the honey is frequently detected in our better quality honey. Although not unpleasant in flavour, it is sufficiently distinctive to lower slightly the grade of a delicate flavoured line. Flowers from August until January, according to locality. A yellow pollen is accumulated on the bees when working this source.

Konini (*Fuchsia excorticata*).

A small tree reaching a height of from 5 m to 15 m and having an irregular short trunk covered with papery yellow or brown bark. The leaves are 3 cm to 10 cm long, silvery beneath, alternate and lanceolate to ovate-lanceolate. The flowers are drooping, about 23 cm long. The calyx is dark purple and the petals red-purple. The berry is called Konini by which the tree is erroneously known. The true Maori name is Kotukutuku. The tree grows profusely on the fringes of the bush.

The flowering period is August to December, during which time nectar and pollen are freely secreted. The honey is light in colour, delicately flavoured, but suggestive of slightly

overheated clover honey and is prone to early fermentation. Granulation is rapid and the grain is smooth. The pollen from all three varieties of *Fuschia* is deep blue in colour and very sticky. Found in the North and South Islands.

Coprosma:

There are over 40 species in the genus ranging from small prostrate shrubs to trees 10 m high. All appear to be wind pollinated, the dust-like pollen is to be seen at times flying in clouds.

However, bees do work this source for pollen when compelled to do so when other pollen bearing plants have nothing to offer. Of this I have indisputable proof having observed bees working the Karamu in an area otherwise completely devoid of pollen. In addition I had the only pollen in the hives analysed and verified as coming from the Karamu. The pollen was salmon in colour. The Karamu (*C. lucida*) is a tree up to 5 m in height with glossy leaves 10 cm to 25 cm long. The flowers are numerous and greenish white in colour, blooming from August to December.

Karaka (*Corynocarpus laevigatus*).

Attains a height of 15 m and is found on the coast in both islands. The leaves are laurel-like and glossy. The flowers are 4 to 5 mm in diameter, in erect, much branched panicles and are white in colour. Very attractive to bees from August to December for a pale yellow pollen and a clear amber viscid nectar, believed to be toxic to bees and brood.

Tauhinu (*Pomaderris phyllicifolia*).

A strongly scented heath-like shrub. The stems and branches are closely covered with fine greyish down. The leaves are small, rounded in shape and grey green in colour. The small pale dull yellow flowers are borne in broad and flattened, much branched clusters from August to early November.

The plant is very common in the North Auckland district but less so further south. The bees visit the plants very freely, particularly in showery weather and towards the end of its flowering period. The honey is medium amber in colour, strongly scented and similar in flavour to Hange Hange. Yields also a little yellowish green pollen.

Spiderwort or Himalayan Honeysuckle (*Leycesteria formosa*).

An evergreen shrub 2 m to 3 m high, originally a garden escape, has established itself in large areas in North Auckland, but also exists in both islands. It has green hollow stems with opposite leaves, 8 cm long, broad at the base and pointed at the tip. The flowers are white and pink in drooping spikes. The flowers are enclosed within pairs of purplish bracts. In some years this is a good honey plant, bearing nectar from August to January. The honey is light amber and full flavoured.

Wild Turnip (*Brassica campestris*).

An annual weed of cropping areas growing up to 1 m in height. The leaves are like those of a turnip but are dissimilar in the arrangement of stiff, bristly hairs. The flowers are buff to pale yellow. An attractive source of pale nectar in early spring when the turnip is a definite competitive source with fruit bloom. The pollen is pale yellow.

Crack Willow (*Salix fragilis*).

This is a medium sized, introduced tree and a valuable early source of nectar and pollen throughout New Zealand, flowering September to October. The honey is light amber and mild flavoured. A surplus is occasionally obtained in some districts. The pollen gathered from the catkins is yellow in colour.

Pussy Willow (*Salix capreaea*),

An even earlier source of pollen and nectar. The honey is light amber, of

distinctive swampy, but not unpleasant flavour.

Weeping Willow (*Salix babylonica*).

An early, but very limited source of pollen and nectar. Pollen light yellow.

Heketara (*Olearia rani*).

A small tree up to 7 m high with branches and leaves clothed with whitish hairs. The leaves are alternate 5 cm to 15 cm long, coarsely toothed. The flower heads, which are white, are in large wide spreading panicles. This is a good pollen plant, but only flowers profusely in some years during September to October. The pollen is yellow hued.

Manatu or Ribbonwood (*Plagianthus betulinus*).

A small deciduous tree, 6 m to 15 m high, found throughout New Zealand and the Chatham Islands. The leaves are alternate, lobed or coarsely toothed and soft. The flowers appear in large terminal panicles up to 25 cm long, very numerous, small and green. The flowering period is from September to October, when bees visit the flower for nectar. The honey is medium amber, light bodied and of good flavour, but a surplus is never gathered by the bees. When young, the Ribbonwood forms a mass of interlacing branches.

Scarlet Pimpernel (*Anagallis arvensis*).

An annual weed found in waste and cultivated land in both Islands. The stems are partly trailing and the leaves opposite, small and without stalks. The flowers are small and scarlet, but sometimes blue, with five petals, appearing during September and October. The bees obtain a pale nectar from the flowers.

Toropapa (*Alseuosmia macrophylla*).

A shrub 1 m to 3 m in height. Leaves 3 cm to 4 cm long, oblong, glossy; the flowers pinkish, drooping, solitary or in one to three flowered fascicles, appear in September and October, yielding a pale nectar keenly sought by bees.

Chou Moellier (*Brassica spp.*)

Grown as a seed crop, and is a valuable source of nectar. It flowers in late September and October. Another honey very similar to rape.

Hedgehog Parsley (*Torilus nodosa*).

Found on roadsides and beneath hedges and worth particular mention. The flowers are white or pale pink, yielding a water white nectar which is of great value to bees during dearth periods.

Poataniwha (*Melicope simplex*).

A small tree up to 4 m high. The leaves are alternate 1 cm to 2 cm long with broad flat stems. The flowers 5 mm to 8 mm across are greenish white, fascicled in the branches. Worked freely by bees in September and October for nectar. The honey in the combs is very light. It has a very acid flavour. Abundant in both Islands.

Hawthorn (*Crataegus oxyacantha*).

A familiar hedge plant, flowering in September and October. The bees freely visit the abundance of snow white bloom for both nectar and pollen. The honey is dark amber in colour but possesses a pleasing flavour. The pollen is dull white.

Whau (*Entelea arborescens*).

A small tree up to 6 m high, possessing an abundance of large white flowers worked freely by bees during September and October. The flowers are produced in large drooping clusters. The honey and pollen are similar to that of the Koromiko.

Native Broom (*Carmichaelia aligera*).

A branched shrub, also known as Makaka, growing up to 10 m in height having an abundance of small pea-like flowers light purple in colour. Auckland to Taranaki. There are a number of other native species of *Carmichaelia* elsewhere in New Zealand. The introduced yellow-flowered broom is *Sarothamnus scoparius* (ex *cytissus*).

The Makaka flowers in September and October, while other species flower a little earlier or later. Native and introduced brooms are valuable pollen plants, the colour of which ranges from cream to deep orange. *C. racemosus*, known locally as Scotch Broom produces light amber honey of good quality. It is abundant in Northland, Waikato and parts of South Island.

Fumitory (*Fumaria officinalis* — *F. muralis*).

An annual weed found particularly in cultivated fields and areas of high rainfall. It has a straggling habit and attains a height of 30 cm or more. The leaves are hairless and deeply divided. The flowers, dark pink or purple, are less than 2½ cm long; blooms in September and October but apparently flowers at any time under suitable conditions. Bees gather a little pale nectar from the flowers and dull yellow pollen.

Kie Kie (*Freycinetia banksii*).

A tall climber, with leaves up to 1 m in length, very finely toothed, concave, sheathing at the base. The flowers are in terminal spikes, 7 cm to 15 cm long, surrounded by white, fleshy bracts.

The honey gathered from this plant is water-white in colour, but possesses a strong unpleasant flavour. Considerable surplus has at times been harvested from this source. It is found in the North Island and on the west coast of the South Island. Flowers September to October. Honey not now so plentiful as opossums devour flowers and fruit. This

is now happening to numbers of native plants.

Tutsan (*Hipericum androsaemum*).

A common weed thriving in the high rainfall areas of both islands on the outskirts of bush areas. Up to 1 m in height and growing usually as a shrub. The leaves are egg-shaped, 2 cm to 8 cm in length and are a rich "autumn" colour. The flowers are yellow with stamens in five bundles. This is a good source of orange coloured pollen, flowers during spring and early summer.

Puka (*Griselinia lucida*).

The shining broadleaf reaches a height of 10 m. The leaves are 7 cm to 17 cm long, always unequal-sided or lopsided at the base, very thick and shining. The flowers are axillary panicles, green or yellow, 8 cm to 16 cm long. Flowers September to October. Bees obtain a dull yellow pollen from this source, and nectar in some seasons.

Mallow (*Malva silvestris*).

A weed found on roadsides and waste places. A biennial with kidney-shaped leaves with crinkled edges. The flowers are purple 2 cm to 4 cm in diameter and bell shaped. The blossoms appear during September and October and supply the bees with a little nectar and ample pollen of a white or pale mauve colour.

Privet (*Ligustrum vulgare*).

Flowers September, October and profusely in November, and is very attractive to bees. The flowers are white and fragrant. It is one of the spring nectar sources that combines with other minor flows in building up colonies during a crucial period. The honey is medium amber, heavier bodied and possesses a bitter unpleasant flavour.

Kumerahou (*Pomaderris kumeraho*).

A branching shrub 1 m to 3 m in height. The leaves are 5 cm to 7½ cm long, shin-

ing above and white with down on the under-surface. The flowers are fragrant and profuse, mustard yellow in colour. The plant is visited by bees for approximately three weeks from mid-September for nectar and pollen. The pollen is creamy-white and the honey dark and pronounced in flavour. Confined to the North Island.

Papauma (*Griselinia littoralis*).

A larger type tree up to 17 m in height, useful in providing the bees with pollen, flowering in small green panicles from September to November. Both trees are found throughout New Zealand.

Taupuka or Snowberry (*Gaultheria antipoda*).

An erect spreading shrub, with sharp narrow leaves about 1 cm long. The flowers are small, pink or white and bloom in September to November. Bees obtain a dark coloured nectar from the Snowberry. Common to both islands.

Barberry (*Berberis glaucocarpa*).

A prickly deciduous shrub very popular as a hedge plant. The branches are yellowish and grey. The flowers are small and yellow. An excellent source of nectar and pollen. The honey is medium to light amber in colour and of pleasant mild flavour not unlike buttercup. The pollen is pale yellow, gathered September to November.

Mingi Mingi (*Cyathodes juniperina*).

A small tree up to 5 m high with blackish branches. The leaves are very small, rather rigid and pointed and light green in colour. The flowers are minute, greenish white. The plant is widespread in this district and throughout both islands, and yields nectar very freely, giving a heavy flow in some seasons. The honey extracts easily and is medium amber in colour and mild in flavour. Flowers September to December.

Corokia cotoneaster is a rigid shrub up to 3 m with interlacing black branches. The leaves are alternate and the flowers small and yellow. This shrub is a minor but useful source of nectar, yielding from September to November a pale thin nectar.

Tawa (*Beilschmiedia tawa*).

A fairly tall tree up to 25 m high with trunk up to 1 m diameter and smooth blackish bark, slender branches and pale, narrow leaves, 8 cm to 10 cm long. The flowers are in slender panicles 5 cm to 8 cm across and greenish yellow. A source of dark coloured nectar and dull yellow pollen in September and November. This tree is found as far south as Kaikoura but reaches greatest development in Bay of Plenty.

Laurel (*Prunus laurocerasus*).

A small tree up to 6 m in height, favoured as a hedge plant. The leaves are large and shiny and the flowers small, white and lightly scented. Produced in great profusion from September to November. Laurel is an excellent source of nectar, and sometimes yields extra floral nectar secreted on the under-surfaces of the leaves.

Kohia (*Tetrapathaea tetrandra*).

A slender climber with glossy leaves up to 6 cm long, found from Auckland to Banks Peninsula in the South Island. The flowers are 1 cm to 2 cm across, green, with beautiful coronas of white or yellow filaments. This plant is plentiful on the edge of bush. A good source of whitish pollen and a little nectar in September to December.

Makomako (*Aristotelia serrata*).

Also known as wineberry, grows up to 8 m with reddish bark. The under-surface of the leaves are reddish brown. The blossoms produced in September to December are borne in large panicles, at first faint rosy-red changing to a deep

claret colour. The blooms are worked by bees for reddish pollen only during periods of pollen shortage as the very light dusty pollen appears to make little appeal under normal conditions. Found as far south as Stewart Island. A light coloured nectar is obtained by the bees.

Spurrey (*Spergula arvensis*).

Also known as Yarr, a common weed on lime deficient or acid soils. It is a sprawling white-flowered and much branched annual with fine, needle-like leaves which grow in clusters round the stem. Its flowering period is late September and October. In some seasons where plentiful, the bees gather a little surplus from this source. The honey has a strong flavour and is medium amber in colour.

Black Maire (*Nestegis cunninghamii*).

A large tree up to 16 m with whitish branches. The leaves are 2 cm to 5 cm long, linear-oblong, obtuse and leathery. The flowers, 10 to 15 together, are greenish white blooming September to December. This is a useful pollen plant, the pollen is a dull white. Confined to the North Island and Marlborough.

Ngaio (*Myoporum laetum*).

A small tree up to 10 m in height with bright shining green leaves 5 cm to 10 cm long. The flowers growing two to six together are small and white spotted with lilac. The trees favour coastal regions and flower from September to early December, yielding both pollen and honey.

The honey is medium amber of good flavour and in some years a surplus is gathered. The pollen is a muddy white. The black buds of the trees are protected by a gummy secretion collected by bees as propolis. Found in the North and South Islands.

Lupin (*Lupinus arboreus*).

A spreading soft-wooded shrub found in both islands. The flowers are in racemes usually sulphur yellow, but occasionally white to bluish. This is the only lupin I have noticed growing in a wild state. It is found in waste places and particularly on sandy soils.

It flowers in September to December and is a useful pollen plant. The pollen is salmon in colour, yields a little nectar and in occasional seasons gives a heavy flow. The honey is light amber and possesses a distinctly oily flavour.

Foxglove (*Digitalis purpurea*).

Found from North Auckland to Southland. The stems are simple and erect up to 2 m high. The leaves are ovate, and downy on the under surfaces. The terminal metre of the flower stalks carry the flowers, bell shaped, yellow, white or purple. Blooms in September and December and produces an abundance of white pollen.

Convolvulus is worthy of mention as a honey and pollen plant as it is very widespread and trails over acres of waste land covering such other plants as blackberry. *C. arvensis* or bindweed has a large pink or white bell shaped flower and blooms from September to April. *C. verecundus* is similar in appearance, blossoming in November and December, preferring dry sandy soil. *Calystegia sepium* or Pohue is the most serious weed of this and allied families.

Its flowers are fragrant, long, bell shaped and white, blooming profusely from September to February. *C. tuguriorum* (sand convolvulus) flowers from December to February as does *C. soldanella* or Nahinahi, a lover of sandy areas. All produce light yellow pollen in very large grains. Very pale nectar is also stored by the bees.

Karo (*Pittosporum crassifolium*).

Found in abundance in the East Coast

Bays. It is a small tree up to 10 m in height with black bark and twigs. The leaves are thick and tough and much waved. The flowers are deep purple 1 cm long carried in terminal umbels produced from September to early December. It is extensively grown as a hedge plant. Confined to the North Island.

Haekaro (*P. umbellatum*).

Another useful member of this family, found only in North Auckland south to Gisborne. Flowers September to December.

Taraire (*Beilschmiedia tarairi*).

A tall tree reaching to 25 m in height, with straight erect trunk. The leaves are glossy, 8 cm to 15 cm long. The flowers appear in branches panicles and are inconspicuous. Worked by bees during September to December for a dark coloured nectar and a dull yellow pollen. Found in the North Island only.

Black Locust or False Acacia (*Robinia pseudocacia*).

This tree has deeply furrowed dark brown bark branches bearing prickles. Height 20 m to 25 m. Compound leaves are slender and feathery up to 20 cm long of up to 24 opposite leaflets about 2 cm long. The flowers are scented, large and white. Standards often tinged with pink in pendulous racemes up to 20 cm long.

This is a splendid source of nectar, the honey being white and of delicate flavour. The pollen is pale yellow and is gathered by bees during September – December according to locality.

The Kohuhu (*Pittosporum tenuifolium*).

The tree is small, attaining a height of 10 m with blackish bark and twigs. The leaves are pale green, undulate. The flowers are dark purple, almost black, borne in axillary umbels from September to December.

It is a free producer of nectar and small limpid drops may be seen at the base of the corolla. The flowers are heavily scented at night. It is extensively grown as an ornamental tree. The bees visit the flowers in numbers to gather the pale nectar and dark yellow pollen. North and South Islands.

Kaikomako (*Pennantia corymbosa*).

A small tree up to 10 m high with light grey bark. The leaves are slightly serrated and blunt-ended, 2 cm to 10 cm long. The flowers are small in terminal panicles 3 cm to 10 cm long, numerous, waxy white and fragrant. Visited by bees for a pale nectar during September to December.

Ake Ake (*Dodonaea viscosa*).

A small hard-wooded tree 5 m to 10 m high with flaking reddish-brown bark. The leaves are alternate 2 cm to 8 cm long. The flowers appear in few-flowered terminal panicles and are green in colour. Worked by bees from September to January for greenish yellow pollen and occasionally for honey of a light amber colour and strong flavour. Distributed throughout the Pacific Islands.

Taranga (*Pimelea longifolia*).

A shrub up to 2 m in height with numerous narrow shiny leaves 2 cm to 5 cm long. The flowers are small, white in colour, silky and fragrant, borne in terminal heads. The flowering period is September to January. *P. tomentosa* is a similar type of shrub flowering during the same period. These plants are readily visited by bees for a pale heavy bodied nectar.

Wild Geranium (*Geranium dissectum*).

A widespread weed in North Auckland, but extends as far south as the Bluff. A perennial with branching, trailing or semi-erect stems, 30 cm to 60 cm long. The leaves 5 cm to 15 cm long, are on long, slender stalks. The flowers are

purple and about 1 cm across of twelve to fourteen florets. In bloom from September to January when freely visited by bees for nectar and large dull orange pollen grains.

Tutu (*Coriaria arborea* and *C. sarmentosa*).

Small trees and shrubs with shining opposite leaves, four-angled branches and long drooping racemes of flowers 15 cm to 30 cm long, small and reddish. The flowering period extends from September to March and offers bees an enormous source of pollen.

On Rangitoto Island from September to November is a dearth period of pollen and the Tutu plants are covered with bees throughout the day collecting a dull greenish yellow pollen. The Tutu is also a source of toxic honey dew under certain conditions.

Poroporo (*Solanum aviculare*).

A soft-wooded 3 m high shrub with dark green oblong leaves 10 cm to 27 cm long, found in both islands. The flowers, cymose, three to 10 together, usually lavender, sometimes white, bloom from September to March. The source of a mild flavoured, amber honey.

Putaputaweta (*Carpodetus serratus*).

A flat topped tree attaining a height of 10 m. The leaves are alternate, slightly downy, veined and marbled in appearance. The small cream fragrant flowers are borne in broad and flattened clusters — the centre flower usually opening first — and the whole cluster more or less hidden among the leaves. The tree flowers from September to April. Large caterpillars and wetas frequent the trunk of this tree. The flowers are good sources of honey and pollen. The honey being light amber in colour, mild of flavour with a slight similarity to gum. The pollen is a pale yellow. Common to the three islands.

Crimson Clover (*Trifolium incarnatum*).

An annual, flowering in October, and a valuable honey plant when grown in sufficiently large areas. It is sometimes grown for hay and is therefore worthy of inclusion in a list of honey plants. Honey from this source appears to be no different from white or red clover and is available earlier than these clovers. Blunt broad stipules in contrast to the long pointed stipules in red clover and alsike identify this plant.

Rough Clover (*T. scabrum*).

A clover that trails along the ground and favours poor soil and waste areas. The leaves are very small, somewhat like the petal of a flower. The flowers are small and light pink with a whitish corolla. Bees obtain whitish pollen from this plant from October onwards. Found in both islands.

Subterranean Clover (*T. subterraneum*).

An annual clover thriving on second class soils, and in the drier areas of the North Island and in Marlborough, Canterbury and North Otago. The flowering period is October to November when a light but steady flow of nectar is available to the bees. The honey is similar to white clover.

Rape (*Brassica napus*).

Grown for stock or seed mainly in Canterbury and Southland. During World War II, some beekeepers in Canterbury obtained as much as 5 tonnes of surplus honey from rape. The plant yields nectar from mid-October to mid-November. The honey is water white, possessing a delicate flavour and fine grained. It is very quick to granulate. The pollen is yellow.

Hedge Mustard (*Sisymbrium officinale*).

An annual weed with large leaves like those of a turnip, a branched leafy stem up to 1 m in height. The flowers are dull yellow borne in long spikes and no more

than 5 mm across. A source of light, peppery-flavoured late spring nectar and yellow pollen.

Charlock (*Sinapis arvensis*).

An annual weed with an extended flowering period. The leaves are like that of a turnip but vary considerably in the number of stiff bristly hairs characteristic of the cultivated race. Grows to a height of 1 m. The flowers are golden yellow but somewhat larger than those of Hedge Mustard. The honey, like that of mustard, is light amber in colour. The flavour is delicate, but rather hot to the palate.

Jointed Charlock or wild radish (*Raphanus raphanistrum*).

Grows to 60 cm tall with pale yellow, white or lilac flowers. The petals are veined, a good source of light coloured nectar from October to December.

Hawkweed of Hawkes Beard (*Crepis capillaris*).

An annual weed growing to a height of 45 cm with variable leaves, lobed and hairless. The flowers are yellow, similar to Dandelion but smaller.

Mouse Eared Hawkweed (*Hieracium pilosella*).

A perennial spreading plant with rosette leaves, long and hairy, whitish below, flowers solitary, yellow on leafless stalks 20 mm to 25 mm tall. Once confined to Canterbury but now found in the North Island.

Hawkbit (*Leontodon taraxacoides*).

A biennial much like a dandelion in shape and size, but the leaves are not so deeply lobed. The flower heads are borne on a single unbranched flower stalk. The flowers are bright yellow.

All the above weeds are valuable honey plants flowering between August and February. The honey varies from extra

light amber to medium amber and is mild to delicate in flavour. I have seen supers of surplus honey gathered from Hedge Mustard in a stony area not far from Auckland City. The honey is of fine flavour, sparkling and an extraordinary bright yellow colour. All yield pollen ranging from dull white to bright yellow in colour.

Wild Rose (*Rosa spp.*).

In some localities wild roses are a useful source of both pollen and nectar following as it does the early Manuka flow. The nectar is very light in colour and extremely thin. The pollen is pale yellow.

Gorse (*Ulex europaeus*).

A well-known hedge plant and in some localities a serious weed. It is a native of Europe and flowers throughout the year. As a pollen plant it is invaluable to beekeepers in the spring and autumn yielding large quantities of pale yellow pollen.

In Australia gorse is listed as a honey plant, and under certain conditions is capable of yielding nectar in New Zealand. During a particularly fine spring in South Canterbury on one occasion I observed bees working gorse for nectar. The weather was dull and sultry following rain. The nectar was light in colour and bright and clear.

Dandelion (*Taraxacum officinale*).

A common herb growing in pastures and shows great vigour in damp areas. The flowers are yellow and daisy-like in appearance, and make a fine show in the early spring months, although some flowers persist throughout the year.

The dandelion is of great value to colonies during the building up period and is worked by the bees even under adverse weather conditions. It is a free yielder of vivid orange pollen, and a good source of medium amber honey of pleasant flavour, and good blending qualities.

Turnip (*Brassica rapa*).

Grown as seed crop in Otago and elsewhere as a root crop. When left to seed it is a valuable source of nectar. The flowering period is late October or November. The honey is white and similar to Rape in appearance but the flavour is distinctly turnip.

Rata (*Metrosideros robusta*).

The Northern Rata is a large forest tree sometimes exceeding 30 m in height. The leaves are much shorter and broader than those of the Southern Rata, but the flowers appear to be the same and are bright scarlet. The normal flowering period for North Auckland is October and November, and December and January further south. Much of the plant life of the far north is hybridised and the identification of species in many cases is most difficult. This crossing of species probably accounts for a good deal of the out of season flowering of many trees and shrubs.

There are 12 species of rata and all are prone to hybridisation and will also cross with the Pohutukawa (*M. excelsa*). The honey produced from Rata is water white in colour, fine grained and of delicate distinctive flavour. It granulates very rapidly. This tree is not a heavy pollen producer, which is in colour creamy or dull white.

Pukatea (*Laurelia novae-zelandiae*).

A tall tree 25 cm to 30 m in height and having a pale bark. The leaves are thick, opposite, 4 cm to 8 cm long, toothed and shining. The flowers are in axillary racemes and very small. The flowering period is October to late November when bees visit the trees for a whitish pollen. Found in the North Island and northern part of the South Island.

Red Shank (*Polygonum persicaria*).

A widespread weed in Auckland extending south and is also found in damp

areas in the South Island. Grows to 60 cm in height, the stems are round and shiny with swollen knots and a general red tinge. The leaves are simple with occasional black blotch on the upper side. The flowers are pink, very small, in dense clusters 2½ cm or so in length, and are borne at the end of branches. The plant flowers from October onwards. Bees gather a dark amber nectar with a decided "bite" from this source.

Hakea (*H. saligna*).

A tall, bushy glabrous shrub with oblong-lanceolate leaves. The flowers are cream, in dense axillary clusters. Grown as a hedge plant in the Auckland Province.

At Kerikeri, in Northland, most properties are enclosed by Hakea hedges. Here the plant attains exceptional height and depth.

Surplus honey is frequently obtained from this source in the Kerikeri and Kaikohe districts. The quality of the honey is outstanding being little inferior to that from clover. The flow is at its maximum in November.

Black Medick (*Medicago lupulina*).

A somewhat similar plant to Burr Clover, found on limestone country. The flower heads are small and yellow, later replaced by black seed pods. The blooming period usually precedes that of white clover. Bees visit the plants for a light golden nectar for a short period. The pollen is yellow.

Mairehau (*Phebalium nudum*).

A beautiful slender branching shrub with reddish bark. The leaves are 2½ cm to 4 cm long. The white flowers 4 mm to 8 mm across in terminal corymbs, are highly scented. This is a good source of nectar from October to December, but the honey is dark and bitter. Rarely found south of Thames.

Cabbage Tree or Ti-Kouka (*Cordyline australis*).

A tree sometimes attaining 17 m in height. The small flowers are creamy white, bell shaped and regular, carried on much branched, 1 m long flower stems.

The Cabbage Tree grows in either swamps or open country and produces a surplus every third year when it flowers profusely. The flowering period is late October to mid-December. The honey is medium amber in colour, and of medium flavour.

C. banksii is a long leaved variety of cabbage tree and grows to a height of 3 m. The flowers are white, strong scented and bloom in December. The honey from this source is rather acid in flavour.

Flax (*Phormium tenax*).

Its dull reddish flowers are borne in large panicles regularly spaced on 2 m to 3 m long flower stem and are in bloom from late October to January. The blossoms secrete a great quantity of pale clear nectar. The structure of the flower prevents the bees entering the narrow corolla, but they overcome this difficulty by inserting their tongues where the petals overlap.

Flax honey is medium to dark amber in colour, of poor flavour and coarse grain. Fortunately a heavy flow from this source is experienced only every third or fourth year. The bees have been observed working flax at 5.30 a.m. This plant is a good source of deep salmon pollen in all seasons.

Chickweed (*Stellaria media*).

An abundant weed in cultivated soils. It is a low sprawling annual 10 cm to 12 cm high with pale green tender leaves. The flowers are small, white and clustered, and bloom from October to March. The bees gather nectar from this plant during periods of dearth.

Mouse Eared Chickweed (*Cerastium viscosum*).

Has slender straggly stems 30 cm long. The flowers are small, white, arranged in small terminal clusters. Found in pastures and waste places. Its value to bees and blooming period is similar to *S. media*.

White Champion (*Silene alba* syn *Melandrium album*).

Possesses broad dark green hairy leaves resembling plantain and lying flat on the ground. Hairy flower stalks attain up to 1 m in height, branched, with white flowers at the ends. The Red Champion (*S. divica*) has shorter and more rounded leaves and the flowers, pale at first, change to bright red. Both varieties bloom from October onward. The honey from these sources is dark amber, heavy bodied and aromatic in flavour. Old European herbalists attributed miraculous properties to the honey of the Champions.

Daisy (*Bellis perennis*).

A well-known pasture weed and worthy of mention as in some seasons it is the source of a pale yellow pollen in October. Bees appear to work the flowers for nectar in November every year but the supply is probably negligible.

Sowthistle (*Sonchus oleraceus*).

Sow thistle or Rauriki and **Prickly Sowthistle (*Sonchus asper*)** or Puwha are closely related thistles, the only obvious difference being in the leaves of the latter variety, which are more prickly and waved.

These thistles grow to a height of about 1 m and bear large numbers of pale yellow flowers in the spring of the year. They are not a good source of pollen but provide the bees with a small quantity which is pale yellow in appearance. They are, however, of more value as a honey plant secreting nectar freely for a short period. The honey is extra light

amber, granulates rapidly with a fine grain and mild flavour.

Tawheowheo (*Quintinia serrata*).

A small tree up to 12 m in height. The leaves are 8 cm to 15 cm long and roughly serrated. The whole plant is covered with small whitish scales. The flowers are pale lilac 5 mm in diameter and borne in axillary racemes 8 cm to 10 cm long. The flowering period is October to November, and is freely worked by bees for a thin pale nectar. A very abundant plant in the Waitakere Ranges, and extends to Northern Taranaki and Hawkes Bay.

Rewarewa (*Knightsia excelsa*).

New Zealand Honeysuckle is a distinctive tree related to the Australian bottle brushes and is confined to the North Island and Marlborough Sounds. The Rewa-Rewa attains a height of 30 m or more and flowers from October to the end of December. The numerous tubelike buds are set around a long floral axis. The buds have a unique method of opening to expose the curious tangled flowers. Mainly a bird pollinated tree, has proved of great value to bees.

It is not a completely reliable source of nectar, favouring wet years when it yields heavily. The honey is medium amber in colour, and has a slightly burnt medium flavour, difficult to mask when blended with other honeys. It is heavy bodied and will not always freely leave the combs. The honey is slow to granulate and possesses a very coarse grain that is difficult to overcome. Its keeping qualities are exceptional. Rewa-Rewa pollen is light yellow.

Winter Cress (*Barbarea verna*).

A biennial weed rather common on roadsides and waste places, particularly in Northland, but is found in both islands. The stems are rigid, erect and angled, the leaves lobed, the flowers bright yellow. In flower from October

to December. Freely worked by bees for a deep yellow nectar.

Wild Cabbage (*Brassica oleracea*).

A rape-like annual growing on sea cliffs in both islands but often found inland. Similar to wild turnip having a single vein on both sides of the pods. The flowers are yellow and unlike the wild turnip open below the unopened buds. Attains a height of about 1.5 m. Worked by bees between October and December for a very light coloured nectar, and pale yellow pollen.

Tawari (*Ixerba brexioides*).

A magnificent wide spreading evergreen tree up to 17 m in height. The coarsely serrated leaves are thick and tough, from 8 cm to 18 cm long. The large waxy white flowers, 25 mm or more across, are carried in flat panicles and are produced from October to the end of December.

This tree is perhaps the most beautiful in the New Zealand bush but is now greatly reduced in numbers. It must have once been a major nectar source as it yields heavily and is eagerly visited by bees. The honey is a dull white in appearance, very sweet and mild flavoured, and frothy. Its keeping qualities are not good as the honey is high in water content. Extends from Whangaroa to Hawkes Bay.

Ling Heather (*Calluna vulgaris*).

This plant is variable in habit from prostrate forms several centimetres high to bushy shrubs up to 1 m high and across. The small leafy shoots carry racemes of bells 6 cm to 10 cm high usually a purplish pink, produced through late spring and summer. Large areas are established in New Zealand in high alpine or tussock country. This is a famous Scottish heather and is a heavy nectar producer in this country. Considerable quantities of cut comb honey have been exported from this source. The honey is reddish in colour and of

mild but pronounced flavour. The plants yield copious quantities of slate coloured pollen.

Hinau (*Elaeocarpus dentatus*).

A short tree with oblong-ovate leaves. The flowers are small creamy white borne in numerous racemes. The flowering period is October and November. In some seasons bees are strongly attracted to the blossoms which yield nectar freely. The honey is light in colour and mild in flavour.

The pollen is greenish white. A related species, *E. hookerianus* (Pokaka) flowers from November to February. The leaves are longer than those of the Hinau and the flowers greenish white. Common to both islands.

Oxalis (*Oxalis corniculata*).

Yellow Sour Weed or Wood Sorrel, a prostrate perennial weed confined to lowland pastures. The leaves are clover-like and brownish. The yellow flowers are 12 mm across and bloom from October to March. An excellent source of deep yellow pollen. Abundant in both islands.

Titoki (*Alectryon excelsus*).

Attains a height of up to 20 m. The flowers, fruit and panicles are clothed with a rusty down. The whole of the flowering panicles appear to be of reddish-brown from the deep colour of the anthers. The leaves are alternate and 10 cm to 30 cm long. A source from October to December of a brownish pollen and light amber honey. Wasps (*Vespa germanica*) are attracted to the bark of this tree. Found in the North Island and part of the South Island.

Lantana (*L. camara*).

A large leaved shrub. The flowers are either yellow or red in dense heads. This plant is fairly widespread, but in the north a very large area exists in the

Hokianga district. The plant secretes heavily, the honey being dark amber, extracts freely and possesses a fig flavour. The flowering period is, October to December.

Mahoe (*Melicactus ramiflorus*).

Sometimes called the Whiteywood because of its white bark and timber, the maximum height of the Mahoe is about 10 m.

The flowers are greenish yellow and very small, produced in fascicles upon the branches below the leaves. The leaves are oblong, toothed on the edges, and 5 cm to 8 cm long. The flowering period is late October until the end of January. The male and female flowers grown on separate trees and bees gather an abundance of creamy pollen from them.

The Mahoe yields freely a dark amber honey collected eagerly by bees when competitive sources have little to offer. Common to both islands. (*M. lanceolatus*) is a much less common related plant with blue flowers. It is excellent for honey and pollen and has an extended flowering period.

Milk Tree, Turepo (*Paratrophis microphylla*).

Derives its common name from milk-like sticky juice that exudes from the bark when it is cut. Attains a height of 12 m. The female flowers, whitish green, are produced in early October until February in short spikes or clusters. The male flowers in catkins. Yields a greenish pollen and pale nectar. Found in both islands.

Kamaha (*Weinmannia racemosa*).

A round-headed tree up to 25 m tall. The leaves are opposite 3 cm to 8 cm long, serrated, and dull green in colour. The flowers are white and in axillary or terminal racemes 2 cm to 10 cm long and bloom from November to January,

according to locality. Kamahi trees are found as far north as Hokianga County and extend as far as Stewart Island.

Pure Kamahi honey is probably the worst flavoured honey produced in New Zealand. It is bitter, and accentuates with age, predominating the flavour of blends. Its colour is extra light amber. The pollen is whitish.

Southern Rata (*M. umbellata*).

Seldom exceeds 20 m in height. The leaves are a glossy green, smooth, sharp pointed and narrow for their length of 2 cm to 10 cm. The flower is bright crimson appearing in short, broad heads. The stamens are numerous as in all species of the genus. It occurs from the Waikato district southwards, but is not common in the North Island or on the east coast of the South Island. It favours mountain and sub-alpine areas and is abundant on the west coast and southern part of the South Island and Stewart Island. It flowers from late November onward throughout the summer, according to altitude. The honey is similar to the Northern Rata.

Wild Garlic or Onion (*Allium vineale*).

A bulbous perennial with slender erect stems clothed below by sheathing bases of leaves. The flowers are numerous and small, purplish to white in colour. This is a fairly widespread weed in Northland and Auckland.

The honey produced is light amber in colour with a peppery flavour, which improves with age. The flowering period is late November. *A. triquetrum* abundant in Auckland province. White flowered, pollen yellow, honey white and peppery. A valuable early spring source.

Bush Pea (*Pultenaea daphnoides*).

A native of Australia and has become established over a wide area in North Auckland. Bush Pea favours waste land

and scrub covered country. The shrub attains a height of up to 2 m and has a distinctive appearance with its erect branches. The leaves are pointed and club shaped about 3 cm in length. The flowers are found at the tips of branches in dense clusters. They are orange coloured with a dark purple centre.

Bees are attracted to the flowers in November and where the plants are sufficiently plentiful are able to secure a good surplus of honey. The honey is very similar to that of the Blue Pine, being light amber in colour with a pleasing distinctive flavour.

Sweet Clover (*Melilotus spp.*).

The great American honey plant is grown in relatively few areas in New Zealand, but is freely naturalised on sands near Napier. The plant is a biennial and does not flower until the second year. It is a tall much branched plant bearing numerous white or yellow flowers. It thrives in all types of soil and on river banks, quarries and railway embankments. It is little sown in pastures. The flowering period commences in November and continues until late February. The honey is white in colour and the flavour slightly vanilla-like and delicate. It granulates rapidly with a fine grain.

Blue Pine Weed (*Psoralea pinnata*).

A native of South Africa. Blue Pine has spread throughout North Auckland, Great Barrier Island and parts of the South Island and Waikato, and thrives on rough clay country and amongst secondary growth. It is a shrub attaining a height of 1 m to 3 m. The flowers are pea shaped and blue with white wings, yielding nectar heavily in November.

The honey is extra light amber and of good body. Granulation occurs very slowly resulting in a coarse grain. This is easily rectified by the application of a fine grained starter. The flavour of this

honey is distinctive although mild reminding one of dessicated coconut.

Rama Rama (*Lophomyrtus bullata*).

A reddish, blister-leaved shrub, up to 8 m in height, flowering in November, December and January, and is found mainly in the North Island. The flowers are white and are followed by red berries. Grows well in damp places. Worked freely by bees for a pale yellow pollen and a little nectar.

Rohutu (*Lophomyrtus obcordata*).

A relative of the Rama Rama with small heart-shaped leaves and white flowers. Flowers at the same period as the Rama Rama, freely visited by bees, and grows in both islands.

Tar Weed (*Parentucellia viscosa*).

An annual about 30 cm in height. The leaves are 4 cm long and deeply marked, growing from the main stem. The flowers are 2 cm long with bright yellow corollas growing directly from the upper part of the main stem. The plant is sticky to the touch. Favours clay soil and moist places in both islands. Yields heavily in November and December. The honey is light amber in colour and possesses a distinct cinnamon flavour.

Yarrow (*Achillea millefolium*).

Found in pastures and roadsides and is an introduced perennial. It reaches the height of about 30 cm and possesses long feathery leaves. The flower heads are white, about 6 mm across and assembled in clusters. On some soils in dry seasons they take on a pinkish hue.

Pollen from this plant is dull creamy white and is gathered in November and December. The bees do not appear to work Yarrow for nectar, but this may be because of other sources offering at this time of the year.

Chicory (*Cichorium intybus*).

A perennial herb attaining a height of 1 m and is found in pastures and waste places. The leaves are large, smooth and tooth shaped. Chicory flowers bloom in succession and are slightly larger than those of the dandelion. They are bright blue in colour. Bees eagerly seek the creamy white pollen which is available during the months of November and December. Chicory secretes nectar freely during showery weather. It is water white and very light bodied.

White Clover (*Trifolium repens*).

Clover honey is the mainstay of New Zealand beekeeping. It brings the highest price on the world's markets and generally sets a standard for all other honeys. The plant is an introduced perennial adapted to a wide variety of soils and conditions, but does not thrive on acid soils and nectar secretion is retarded during periods of high humidity.

The main flow from clover may occur at any time from early December to early January according to locality and weather conditions. In North Auckland the flow may begin in early November and continue intermittently until mid-February. Here the flow is never heavy and crops are always light. Volcanic soil induces exceptional plant development in Northland, but crops are poor. The best returns in Northland are obtained from swamp land. Clover pollen is a brownish shade of green, almost olive.

Lotus Major (*Lotus pedunculatus*).

The marsh birdsfoot trefoil of Europe, found throughout New Zealand, grows well in North Auckland and thrives on the clay of the far north. The bees work it during November and December. The cappings produced from this honey bear a distinctive yellow appearance. Honey from Lotus Major is very heavy bodied, occasionally remaining in the combs after a normal time in the extractor. It is of excellent flavour and

extra light amber in colour. The pollen is deep yellow. *L. corniculatus* is an equally good honey and pollen source.

The Hairy Lotus (*Lotus angustissimus*).

Thrives equally well on clay soils as its close relative, Lotus Major. The bees work this source freely for both honey and pollen, which is very similar to that produced by Lotus Major as I have never been able to detect a difference in hives gathering from both sources. It is confined mainly to the North Island.

Supplejack (*Ripogonum scandens*).

A black and brown stemmed climber. Its long racemes of green coloured inconspicuous flowers at the ends of the shoots provide the bees with a good supply of nectar during November to January.

Native Rock Lily (*Arthropodium cirratum*).

A plant with conspicuous white flowers 2 cm across and pink stamens. The Rock Lily is 1 m high and has narrow glossy leaves. Its flowering period is November and December and it is favoured by bees during November, when they gather brownish pollen and a little watery nectar. This plant grows profusely on cliffs and rock faces.

Taramea (*Aciphylla colensoi*).

An erect rigid perennial herb having long sword-like leaves forming a dense tuft up to 60 cm in height, found from the Volcanic Plateau to the centre of the South Island. The flower stalk reaches a height of up to 2.5 m and bears umbels arranged in a stout, erect and leafy raceme, greenish yellow in colour. The flowering period is November and December. Nectar is heavily secreted and in dry seasons the plants are alive with bees. The nectar is water white and can be shaken from the flowers.

Bush Ramblers (*Muehlenbeckia australis* and *M. axillaris*).

Two native rambling climbers, found in both islands. The former has a grooved twining stem with 5 cm heart-shaped leaves. The flowers are in spiked panicles and greenish in colour. Its blooming period is from November to December and it produces whitish pollen and a fair flow of nectar of a dark amber colour when stored in the combs.

M. axillaris covers the ground and sometimes forms a small bush. The flowers are produced singly in the axils of the leaves being greenish white to white and bloom early in October. The honey and pollen are similar to the first mentioned species. All plants of the *Polygonaceae* are useful for honey which ranges from medium to dark amber, is of good flavour and slow granulating. They also produce pollen at periods when there is often a dearth.

Pohutukawa (*Metrosideros excelsa*).

A large much branched tree which reaches a maximum height of about 50 m and is confined to the Auckland Province. It is a coastal tree, but nevertheless grows well inland. I have also seen it used as a hedge plant and when kept well cut back can easily be controlled and provides excellent shelter.

The leaves of the Pohutukawa are about 8 cm long and have a white downy under-surface. The flower buds are snow white and the flowers a brilliant scarlet. (The smaller-leaved Kermadec Island Pohutukawa which is widely grown in gardens and streets, flowers from time to time throughout the year). In suitable seasons there is perhaps no finer source of nectar than the Pohutukawa. High winds during the flowering season play havoc with the flowers and greatly shorten the duration of the honey flow. Dry seasons result in the heaviest flows from Pohutukawa, the bees working the blossoms from dawn until after dusk.

Nectar secretion begins in late November. In wet seasons the sugar concentration of the nectar appears to be too low to attract the bees until mid-afternoon. The flowers offer ample greenish yellow pollen which covers the nectar gathering bees. No more pollen than that required for immediate needs is collected, so copious is the nectar flow. This is unfortunate as good Pohutukawa areas are often zones of pollen shortage.

In the Awanui district in the extreme north, a single yellow flowered Pohutukawa can be seen flourishing amidst its scarlet flowered relatives. Pohutukawa honey is water white when extracted, and granulates in a matter of days. Unless processed the grain is generally coarse. The unique salty flavour of the honey is much appreciated. It does not provide good winter stores.

Blackberry (*Rubus fruticosus*).

Firmly established throughout the Auckland district and common to the wetter areas of both islands. Swamp areas in North Auckland are dominated by blackberries. The flowers are pink and white and bees gather a considerable amount of nectar from the blossoms in most seasons. Much of the honey gathered in North Auckland and perhaps the Waikato that is credited to clover undoubtedly comes from blackberries. The bees work the blossoms between November and January.

The honey is water white in colour, not easily distinguishable from clover in flavour. When granulated it has a dull waxy appearance. A honey dew is produced from blackberries by the passion vine hopper. It is dark in colour and has a fig like flavour. This is also a valuable pollen plant yielding a dull greenish white pollen.

Other berry fruits valuable as nectar sources are raspberries (*rubus idaeus*), which sometimes yield a surplus of excellent honey, white in colour and mild flavoured. The pollen is white.

Gooseberries (*Ribes grossularia*) are also a valuable source and in some areas in Southland wild gooseberries assist colonies to build up in early summer. The honey is light amber in colour and the flavour mild. The pollen is pale greenish yellow.

Lucerne (*Medicago sativa*).

The Alfalfa of America is not a reliable honey plant and is subject to damage by insect infestation. The flowers must be tripped for effective pollination, a function rarely performed by nectar-gathering bees. The flowering period is mid-November to late January.

The honey blends well, being water white in colour, of dull appearance when granulated and a flat delicate flavour. The pollen is pale brownish yellow.

Tumatakuru or Matagouri (*Discaria toumatou*).

A thorny shrub sometimes called Wild Irishman and growing up to 6 m in height. It is a spiny bush with few leaves, sometimes in clusters, but usually singly in the axils of the thorns. The flowers are small, white and plentifully produced in close axillary fascicles. It blooms from November to January and is attractive to bees for both nectar and pollen. The pollen is pale yellow and the nectar has a greenish hue. This shrub is known in the South Island as Matagouri. A surplus of honey is sometimes produced. It is a medium amber colour and mild flavoured.

Loosestrife (*Lythrum salicaria*).

Also known as purple loosestrife, it is a hairless annual, with angled sprawling stems 15 cm to 45 cm in length. The leaves are about 2 cm in length, very narrow and stalkless. Small pink flowers with six stamens appear from November to January. Found in moist places, drains and roadsides. A source of greenish

yellow pollen and dark coloured, strong flavoured honey.

Nikau (*Rhopalostylis sapida*).

A palm up to 10 m in height. The leaves grow to about 1 to 3 m in length. The flowers are white. Nikaus are found usually in dense bush. Bees work the flowers for nectar from November to February. The honey is water white, very light bodied and of rather pronounced flavour. Grows as far south as Akaroa.

Rata Vines (*Metrosideros diffusa*).

The small rata vine flowers from November to January. The flowers are pinkish or yellowish-white. This species of vine may be identified by its unusually small shining dark green leaves.

A surplus of medium amber, strong flavoured honey is frequently secured from this source. The honey is heavy bodied and often will not freely leave the combs. The pollen from this rata vine is a dirty white shade. This climber is common to both islands.

The Akatawhiwi (*Metrosideros fulgens*).

A lofty climbing Rata vine having flowers borne in large terminal, much branched clusters of orange red to crimson colour. The Akatawhiwi appears to be constantly in flower in North Auckland but its normal flowering period is November to April. During suitable weather conditions the bees are continually working this rata vine.

No surplus honey appears to be gathered, but the nectar is a very pale colour and the pollen is a pale pinkish shade. The vine is common to the North Island and parts of the South Island.

Red Clover (*Trifolium pratense*).

Flowers from November to February. It is not grown to any great extent in the north but is a major seed crop in the South Island. It is sensitive to soil conditions and temperature but yields nectar freely under suitable conditions. The

honey is similar to the best from white clover. Its pollen is a distinctive dark green.

Hemlock (*Conium maculatum*).

A poisonous weed with carrot-like leaves. The flowers are white, small and grow close together forming a large showy head of bloom. Hemlock favours damp situations and flowers from November until February. It has been reported from other districts that bees shun this plant, but during periods of dry weather in the Auckland district the bees work the flowers freely, apparently for nectar. There are a number of weeds belonging to this family (*umbellifers*) having the characteristic carrot-like foliage. They flower between November and June and are all attractive to bees.

Toro (*Persoonia toru*).

A small tree, confined to the North Island, growing to a height of 4 m, with tough leaves 8 cm to 20 cm long, glossy on both sides. The racemes of six to 10 flowers are salmon in colour. Bees are attracted to them during November to February by golden nectar.

Hebes or woody veronicas.

A feature of the New Zealand flora. Over 100 wild species have been described and there are many garden forms. Those that I have been able to give some attention to are all worked by the bees for nectar and pollen.

I have obtained pure samples of Koromiko honey from Rangitoto Island and have found it to be of good quality. This plant grows as far south as Invercargill. The colour is light amber and the flavour delicate. In poor years for Pohutukawa, Koromiko honey is extracted as a straight line.

The pollen of the Hebe family is white to dull yellow. Members of this family common in the Auckland district are Koromiko (*Hebe stricta*), a handsome shrub growing to a height of 4m. Its

leaves are long, narrow and glossy, and its flowers white to mauve, borne in 10 cm long racemes, are in evidence from November until early March. The pollen is light buff in colour. Napuka (*Hebe speciosa*) is a strong garden shrub with angular branches and thrives when in reach of salt spray. The flowers are deep purple, borne in dense racemes, and come into bloom in September or October, continuing until late January.

Borage (*Borago officinalis*).

A biennial herb growing up to 1.5 m in height with a strong flesh stem, much branched. The leaves are narrow and coarse haired. The flowers are round, bright blue and 2 cm in diameter. The blooming period is November to March when the bees gather a fawn pollen. The honey is whitish with a yellowish grey tint. The plant is widespread in the North Island but less so in the South Island and is usually found in clumps on flat country.

Maori Dock (*Rumex flexuosus*).

A much-branched herb with long narrow leaves, greenish red and waved at the ends. The flowers, rising on a stalk above the leaves, spread profusely and are intricately branched. The flowering period is November to March. A useful source of dull coloured pollen and minor source of nectar.

Sorrel (*Rumex acetosa*).

Sorrel is worthy of mention in a list of plants of value to beekeepers because it is the source of a dull coloured pollen often available when little other pollen is offering.

Native Forget-me-Not (*Myosotis spathulata*).

Abundant in stony areas, a prostrate perennial herb with narrow hairy leaves. The flowers are small, 5 mm across, white with yellow centres borne in racemes from December. This is a good

source of pollen of a pale deep yellow shade. The plant also produces thin water coloured nectar which is collected by bees.

Akatea (*Metrosideros albiflora*).

The white-flowered rata vine is a climbing shrub confined to the North Island. The leaves of the vine are long and slender with pointed ends and the flowers are small and white, appearing in December and January.

This species of vine is confined to forest areas, whereas other rata vines seem to prefer forest outskirts. Nectar gathered from Akatea is light in colour and body and the pollen is a dull cream shade.

Ragwort (*Senecio jacobaea*).

A perennial weed. It has a rosette of lobed leaves from which arises the leafy flower stalk to a height of up to 1 to 2 m. The stalks bear dense trusses of flower heads, yellow in colour.

This cannot be described as a honey plant in the sense that it is of value. It yields heavily at the same time as the main nectar sources and contaminates the crop with its penetrating bitter unpleasant flavour. The honey is light amber or extra light amber in colour. This weed is firmly established in many dairy-ing and scrub areas and is found as far south as Southland.

Monoao or Spider Wood (*Dracophyllum sp.*).

A low spreading shrub up to 60 cm, the bark is dark grey to blackish, branchlets are slender and reddish brown. The leaves are crowded towards the tips of the branchlets, flowers are small and bell like in terminal racemes. The colour varies from red to white. The plants are members of the heath genus and occurs from the North Cape to Stewart Island. Monoao is very plentiful from Taupo County to Tongariro.

The honey is dark amber in colour and strongly flavoured, herbal and musty in

character. Secretes from early December to late February.

Agrimony (*Agrimonia eupatoria*).

Another weed from which the bees obtain valuable supplies of pollen. The leaves are green on the upper surface, grey and downy beneath. The flowers which have a faint lemon odour are yellow and crowd one above the other on long spikes, and yield a greenish yellow pollen in December to February.

Chinese Privet (*Ligustrum chinense*).

This tree was originally a hedge plant, but thrives so well in this climate that individuals develop into very large trees. It comes into bloom in December and continues through January and February, during which period it yields a heavy flow of nectar. The flowers have a feathery appearance and are cream in colour, blooming profusely. The honey, if mixed with the main crop, can lower the general quality considerably. In its pure state it possesses such a strong and bitter flavour that it would be of value only for manufacturing purposes. It is a bright yellow colour at the top of the light amber class. The pollen of Chinese Privet is sticky and greenish white in colour.

Thistles

The prickly and purple flowered varieties, either biennial or perennial, are grouped in the genera, *Cirsium*, *Carduus* and *Silybum*, and are commonly known as Scotch, Californian, Star thistles, etc. Where they occur in large masses, particularly the Californian (*Cirsium arvense*), they prove of considerable benefit to the beekeeper.

The pollen is easily mistaken for that of the Tree Lucerne being creamy yellow in colour. The pollen of the Star thistle (*Centaurea solstitialis*) is dull purple in colour. Thistle honey is very white in colour, of good grain and delicate flavour, and is available from December to March according to species.

Wireweed or Knot Grass (*Polygonum aviculare*).

Found on roadsides and waste places, but is also a common pest in cultivated ground. The flowers are borne in clusters in the angles above the leaves and are small and inconspicuous. The flowers are white in colour with a tinge of red and are in full bloom during December and remain until March.

It is a useful honey plant in backward clover seasons yielding sufficient honey where plentiful to meet colony requirements. The honey is strong flavoured and dark. (*P. capitatum*), a widespread weed with a useful source of dark nectar long after the main honey flow is over.

Ongaonga or Stinging Nettle (*Urtica ferox*).

A tall shrub with woody stem and variable, coarsely serrated leaves 8 cm to 15 cm long with rigid stinging hairs and small greenish white flowers in racemes. It blooms from December to March and yields a fair quantity of pale nectar.

Whitish pollen is gathered from the catkins of the male flowers. The nectar from the Ongaonga has a cloudy appearance, but the honey granulates extra light amber with a delicate flavour similar to thistle.

Horehound (*Marrubium vulgare*).

Common in waste places and where sheep congregate. It is a perennial, growing 30 cm to 60 cm high, much branches and covered with crinkly woolly leaves 20 cm to 30 cm long. The flowers are small and white, produced from December to March. The honey is a greenish medium-amber shade and of pronounced flavour.

Goats Rue (*Galega officinalis*).

A semi-woody perennial confined to the vicinity of the Manawatu River. The flowers are pea like, purplish to light blue in colour, appearing in December.

A fine grained white honey is produced from this plant. It is also a useful source of pollen.

Lime or Linden (*Tilia spp.*).

Grown in city streets and parks and flowers from November to December.

The nectar is secreted on the inner side of the sepals.

The honey is light amber peppermint flavoured, rather light bodied and has a fine grain. The pollen is dull yellow. In some years these trees are a nuisance as they are a source of heavy yields of sticky honey dew.



TAMHERO

LATE SUMMER
AND AUTUMN SOURCES

Tree Manuka (*Leptospermum ericoides*).

Also known as Kanuka, this is the white wooded variety of Manuka known as white tea tree. These trees attain a height of well over 10 m at times. Tree Manuka is not a reliable source of nectar, but in some seasons a surplus is obtained. The nectar is visible in the base of the corolla of the flowers for a short period early in January.

During February the flowers are alive with native bees loaded with rich cream coloured pollen which Tree Manuka produces in large quantities. Another characteristic of this tree is the honey dew observed sparkling on sooty trunks late in February. The honey is white but has a full flavoured Manuka taste.

Inkweed (*Phytolacca octandra*).

A perennial shrub, soft wooded, forming round bushes about 1.5 m in height. The branches are brittle and the leaves 8 cm to 10 cm in length. The flowers are small, green or white and inconspicuous, arranged on upright tapering spikes 12 cm to 15 cm long. The weed is found as far south as Wellington on waste land and sometimes in new pasture. During dearth periods in late January bees visit the flowers for a pale thin nectar.

Kowharawhara (*Astelia solandri*).

This perching plant of flax-like appearance is found in South and North Auckland. Flowering, in large spreading panicles of creamy white flowers, occurs in January and February when the nectar is very attractive to bees. The honey is white in colour but of objectionable flavour. *A. banksii*, Wharawhara and *A. nervosa*, Kakaha, both ground species, flower in November, and *A. trinervia*, known as Kauri Grass, flowers in February and March.

Bathurst Burr (*Xanthium spinosum*).

A shrubby annual 20 cm to 1 m in height. The stem and underside of the

leaves are whitish. Each joint of the stem is studded with sharp spines. The leaves are lobed and lancehead shaped. The flowers are greenish in clusters in the axils of the leaves.

Little honey is secreted by this plant but it is mentioned because the underside of the leaves exudes considerable quantities of honey dew in some seasons during the late summer. Honey produced in the spring in some seasons is very dark and strong flavoured.

Fennel (*Foeniculum vulgare*).

A wild herb found on roadsides and in waste places, particularly in coastal regions. Fennel attains a height of 2 m. The flowers are bright yellow, minute, and grow close in mass making a conspicuous display. They have a very shiny appearance and are sticky and covered with bees even in showery weather in January and February, which is usually a period of dearth in Auckland. The honey is heavy bodied and extra light amber in colour. The flavour and aroma is strong and unpleasant like aniseed.

Vipers Bugloss (*Echium vulgare*).

Known as Blueweed in U.S.A. and as Patterson's Curse in Australia, it is an annual or biennial with a deep penetrating tap root and a stem 60 cm to 90 cm high. The leaves are 10 cm to 20 cm long and both stems and leaves are covered with bristly hairs. The flowers are crowded on numerous curved lateral 2.5 cm long spikes, 2 cm in diameter, funnel shaped, reddish purple in the bud and bright blue when opened.

The plant is found occasionally in the North Island and is abundant in the northern part of the South Island, where it secretes heavily in January and February and has an extended flowering period. The honey is white, dull in appearance when granulated, delicately flavoured but rather flat and fine grained.

Ornamental Gums.

These thrive in the upper half of the North Island and are found in sheltered places as far as Wellington.

(*Eucalyptus leucoxylon rosea*).

A hardy late autumn flowering tree of medium size. The leaves are slender and grey and the masses of flowers delicate pink. A good pollen source and yields a copious supply of light amber honey of good flavour.

Scarlet Gum (*Eucalyptus ficifolia*).

This is a striking tree flowering in January and February when great clusters of brilliantly coloured flowers ranging from crimson and scarlet through shades of pink and orange. The leaves are dark and glossy, the pollen is cream in colour. This tree gives a heavy flow of honey which usually follows the main honey flow. The honey is rather dark and the characteristic flavour associated with honey from gum trees is pronounced.

Stringbark or Mealy (*Eucalyptus cinerea*).

A medium sized tree with typical stringy bark on the lower branches but smooth and white towards the extremities. The young leaves are silvery blue and the flowers cream. An autumn flowering tree very attractive to bees for pollen and dark medium flavoured honey.

Tobacco (*Nicotiana tabacum*: *Solanaceae*).

Flowers late January and February and is the source of dark amber honey with a strong unpleasant flavour. Not a great deal of this honey is produced, but some has been sent to the Honey Marketing Authority.

The Aka (*Metrosideros perforata*).

A tall woody climber with leaves 1 cm long, thinning, the under surface covered with granular dots. The flowers

of this Ratavine are in cymes, three flowered, axillary. Petals small white. Found in the North Island and parts of the South Island. Flowers in January and February. The honey is light amber of good body, and the flavour mild. At times considerable surplus is harvested from this source.

Towai or Tawhero (*Weinmannia silvicola*).

A dark barked tree attaining a height of up to 18 m, is related to and similar to the Kamahi. The leaves, however, are compound, 5 cm to 15 cm foliolate. The white flowers are produced in slender racemes, 5 cm to 15 cm long. The normal flowering period is January and February, but the tree blooms at times as early as December and again in June.

Honey from this source has been received from as far south as Taumarunui. The flowers yield heavily a honey not unlike Kamahi, but of considerably better flavour, and a top light amber colour. It can, however, be rather sickly and the flavour persists even when blended. The pollen of this tree is white.

Catsear (*Hypochoeris radicata*).

Bears a close resemblance to Cape Weed, but is taller growing and produces more flowers which are somewhat smaller. Catsear bursts into flower in the late summer, usually following a period of rain. It is a valuable honey plant. The honey is extra light amber in colour with a pleasant delicate flavour, slightly acid. It is rather a light bodied honey and somewhat slow to granulate. The pollen which is bright orange is a poor source of protein as the rapid growth of the plants following rain results apparently in abnormal chemical constituents as the bees reared on it lack vitality and quickly die.

Pennyroyal (*Mentha pulegium*).

A perennial creeping weed found in both waste places and pasture lands. It

prefers damp sour soils. The leaves are up to 2 cm long with very short stalks. The flowers are pale blue, crowded in bunches surrounding the stem at intervals. The whole plant has a strong aromatic odour. The flowering period is December to March. The main flow from this source is in January and February.

The honey is aromatic like the plant and possesses a pronounced minty flavour. It is light to medium amber in colour. The grain is very fine and granulation is rapid. Much favoured for "starting" purposes. It can be successfully blended, but the honeys must be carefully chosen.

Lancewood (*Pseudopanax crassifolius*).

Also known as Horoeka, a large spreading tree 6 m to 20 m in height. The juvenile leaves are long, thin and deflexed. The adult leaves are much shorter. The flowers are small and whitish green, produced in loosely arranged terminal umbels. The flowering period is January to April. Great numbers of bees are observed working the flowers for nectar, in late February. The nectar, pressed from the bees' honey sacs, is light in colour and heavy bodied. Common to both islands.

Giant Groundsel (*Senecio sylvaticus*).

A close relative of the notorious Ragwort. Giant Groundsel is abundant on dry banks and gravelly places and is an annual growing 60 cm to 90 cm high. Its flowers are cylindrical in shape and yellow in colour. The Groundsel is a valuable source of late summer pollen which is light yellow in colour. The bees also work this plant for its very light amber nectar.

Thyme (*Thymus vulgaris*).

A branching sub-shrub with woody stems about 50 cm in height. The leaves are hairy with inrolled margins. The flowers appear in clusters three to six in the upper leaf axils. The corollas are

pale purplish to whitish. The flowers appear in the late summer and are very attractive to bees.

The honey is medium amber and the flavour somewhat minty, but much superior to pennyroyal. No attempt should however be made to blend it as, unlike pennyroyal, its flavour does not lose its potency. This honey is much appreciated in Europe. Surplus honey from this source is confined mainly to Central Otago.

Sunflower (*Helianthus annuus*).

Although principally an annual garden plant, it is the source of a copious supply of autumn nectar and pollen, and may prove to be one of the few plants worthy of cultivation expressly as a bee plant. The pollen ranges from light yellow to dull orange according to the sunflower variety. The honey from the sunflower is amber coloured and mild of flavour.

Boxthorn (*Lycium horridum*).

An erect densely and stoutly branched hedge plant with small leaves and white flowers. An excellent source of nectar during February and March. In some years good surpluses are obtained from this source mainly in Taranaki. The honey is of fine texture with a unique delicate flavour and is extra light amber to white in colour. The pollen gathered from this plant is creamy white.

Silver Weed (*Potentilla anserina*).

A perennial weed with silvery leaves having white hairs on the underside. The flowers are solitary and bright yellow. The normal flowering period is February and March, but may bloom throughout the year under hedges and trees. A useful source of dull white autumn pollen and some nectar.

Mint (*Mentha viridis*).

Sometimes called spearmint, is common in wet places and ditches. The flowers

are pale red and are produced in thick clusters. Bees freely work this plant for nectar during February and March. The honey is light amber in colour and of pronounced flavour.

Mana Gum (*Eucalyptus viminalis*).

Also known as white gum, this plant yields heavily and a single large tree will materially assist the store position in the autumn for a number of colonies. This species is easily recognised by the broad arrow design in which the buds are grouped, and the whitish resinous substance to be found on the leaves, the result of Aphides sucking juice from the leaves and smearing leaf surfaces with excrement.

The flowering period extends from February until April and the honey produced is amber in colour. It contains considerable air and is of medium flavour. The white flowers are a fair source of pollen.

Peppermint Gum (*Eucalyptus bridgesiana*).

This species is not very plentiful, but a few stands are to be found in the Auckland district. It is a medium sized tree with a spreading crown and pendulous foliage. The tree holds its buds for about 12 months and flowers in the autumn from February to April, flowering heavily every second year.

The flowers are cream in colour and supply some pollen. The honey is light amber and of fairly mild flavour. There are many species of Eucalypts throughout New Zealand, and most are valuable honey and pollen trees.

Elaeagnus (*Elaeagnus pungens*).

A rapid-growing and much-branched plant growing to a height of 6 m and to great depth. Grown considerably as a hedge. Flowers from late March and April and is very freely worked by bees, particularly during the period of dearth. The flowers are an orange yellow. The honey is medium amber in colour and of poor flavour.

Burr Clover (*Medicago hispida*).

A close relative of Black Medick, flowers in the autumn and early winter. The weeds have a prickly covering from which the name burr clover is derived. The flowers are carried in clusters and are very numerous.

This is a valuable source of nectar in North Auckland at a period when breeding has decreased very little and there is almost a dearth of nectar. The honey is very light bodied as appears to be the case with most late honeys in the north, with the exception of heath.

The colour is extra light amber. The pollen from this plant differs from other clovers in that it is deep yellow. Some varieties are found in the South Island.



FIVE-FINGER

THE FLIGHT
RANGE OF BEES

The distances bees fly in search of pollen and nectar have a definite bearing on their value as producers of honey and for pollination. Practical beekeepers and students of bee behaviour have generally believed that bees will fly between 3 km and 10 km and still greater distances when they have to do so. The selection of apiary sites should be based on the general economy of bee flight as it is related to honey production.

A study of the flight range of honey bees and their distribution within nectar producing areas was made by E.C. Kert (1933b) in Colorado and Wyoming during the summers of 1927, 28, 29 and 30, under the Auspices of the United States Bee Culture Laboratory. The studies were divided into three parts (1) the distances bees fly for nectar and pollen (2) the effect of distance on their production and (3) their distribution within nectar producing areas.

1. Colonies were located at varying distances up to 13.6 km from a nectar source with one apiary placed well within the same nectar sources, and observations were made over three summers. The year 1927 was a poor year for honey production, 1928 was considered above average, and 1929 was of average value.

On all three years the bees from the different stations returned with sweet clover pollen and nectar, the greatest distance flown from the hives to the irrigated area being 13.6 km, one way. How much further the bees flew within the nectar sources was not determined.

At another location in Wyoming bees from a commercial apiary were observed to fly from one irrigated valley, in which they generally worked, to another valley some distance away. The distance between the two irrigated regions was surveyed in the line of bee flight and was found to be 7.5 km.

The nectar and pollen plants were much the same in both valleys.

2. The effect of distance on production of colonies varied with the years, with distance having less effect in the two better producing years than when conditions were less favourable. A distance of 1.6 km to 2.5 km had little effect on production in the average to better than average years. The average of the three years indicated that, beyond the 1.6 km location, colonies produced less as the distance increased.

3. When located within a good source of nectar and pollen, the greatest concentration of bees occurred within the first .8 km but with a spread of at least 4.5 km from the apiary site. Further, while some of the bees were found in various fields in different directions from the apiary, the major concentration took place in one general direction from their hives. More bees were found in fields 4 km from the apiary in the favoured direction than in similar fields situated much nearer but in a different direction.

Sturtevant and Farrar (1935) carried on further studies to determine the effects of distance on honey production and found that their colonies located within the nectar source stored from 20.7 to 26.6 per cent more than those located 2.4 km away from the same source.

Beutler (1951) determined that her experimental bees used 10 mg of sugar per hour of flying time and reasoned that the nearer to the source of supply the colonies are located, the greater will be the number of trips they will make with a greater net gain. She assumed that the bees would exhaust their supply of nectar nearby before going further afield.

Ribbands (1952) reported that a foraging distance of but 1.2 km reduced the mean total gain of colonies by 32 per cent over those located within the nectar source in a good year and by as much as 83 per cent in a poor season.

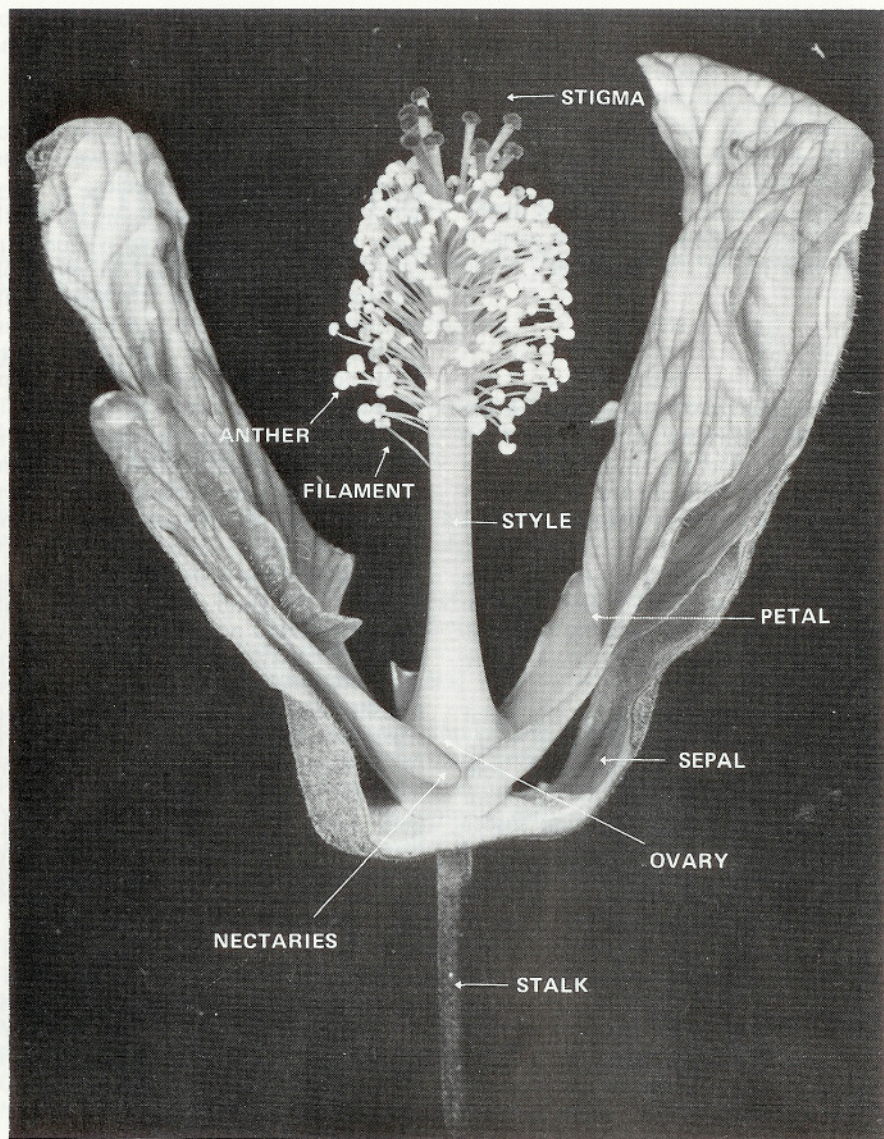
Extract from "Beekeeping" by John E. Eckert & Frank R. Shaw.

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THE FLOWER

by David Williams, Rotorua.

IN ASSESSING the value of pollen and nectar sources it is worth considering the relationship between the bee and the flower.

Pollen provides protein, fats, vitamins and other elements and is essential in brood rearing. Young bees under 10 days old must consume it to produce

the rich brood food on which the larvae are fed and, as in all cases, they have their preferred species, whereas in the case of nectar, the choice is a simple one and the bees go for those flowers producing adequate quantities of nectar, the more concentrated the better.

We might consider the functions of the flower parts. A flower has three parts of direct interest to the beekeeper. These are:-

- (i) stamen
- (ii) anthers
- (iii) nectaries

The stamen is the male portion of the flower and consists of filament and anther. The filament is, as the name implies, a slim spike on top of which is attached the pollen-containing or holding anther.

A ring of these usually surrounds the more solid, central pistil which, if complete, consists of the swelling ovary at the base, the columnar style, and the stigma.

The nectaries are located in the basal cup of the flower and nectar, as such, has no functional reproductive role whatsoever except that of luring a pollen-carrying and distributing insect to the flower and causing it to pass both anther and stigma as it gathers the nectar in the bottom.

To reinforce the attraction the base of the floral cup may also radiate in the ultra-violet frequency range like a beacon.

The two basic divisions in plant reproduction as meant here are between wind – and insect-pollinated species.

Wind distributed pollen grains are small, light, dry, and are produced in enormous quantities. Species relying on wind-pollination usually have simple, small, inconspicuous flowers and produce no nectar. Thus radiata pine and other exotic conifers are useless for beekeeping purposes.

On the other hand, the pollen grains intended for insect-distribution are comparatively large and slightly sticky. They are usually ridged in some way to allow for expansion and contraction.

It takes only one pollen grain to fertilise a flower. The grain settles on the stigma and protrudes a pollen strand through a thin spot in its covering. This tube contains the male gametes and these are transmitted into the stigma, down the style, and so to the basal ovary where cell division and multiplication is immediately activated.

Bees have a most important part to play in all this. They get their fair share of the pollen as a reward, and all the nectar.

PLANTING FOR PRODUCTION

A list of useful source trees first published by the National Beekeepers' Association of New Zealand in 1967.

AUCKLAND

The following trees are of value in the Auckland district for either nectar or pollen. It remains for the NZ Forest Service and others to decide those most suitable for inclusion in their tree planting programme:

Hakea	H. saligna; nectar.
False Acacia	Robinia pseudoacacia; nectar - pollen.
Pohutukawa	Metrosideros excelsa; grows very well inland as well as on the coast.
Puriri	Vitex lucens; a useful winter pollen source.
Tanekaha	Phyllocladus trichomanoides; helpful where pollen shortages are experienced.
Totara	Podocarpus totara; helpful where pollen shortages are experienced.
Rewarewa	Knightia excelsa; honey and pollen.
Hinau	Elaeocarpus dentatus; pollen and nectar.
Houhere	Hoheria populnea; autumn source of pollen and nectar.
Yellow Kowhai	Sophora microphyllia; early nectar source.
Tawari	Ixerba brexioides; nectar.
Mahoe	Melicytus ramiflorus; nectar and pollen.
Kohekohe	Dysoxylum spectabile; yields some nectar and pollen May-July.
Titoki	Alectryon excelsus; pollen and nectar.
Tawhero	Weinmannia sylvicola; nectar source in February.
Kawaka	Libocedrus plumosa; pollen.
Matai	Podocarpus spicatus; nectar.
Putaputaweta	Carpodetus serratus; nectar and pollen.
Genus Pittosporum	All excellent for either nectar or pollen.
Ngaio	Myoporum laetum; nectar and pollen; grows on coast, but does well inland.

The following trees are heavy nectar yielders in their natural habitat, but could not be reliably recommended to do the same in New Zealand. Experience has shown that plants which are good nectar bearers in one country frequently fail to produce honey when grown elsewhere.

Tree of Heaven	Atlanthus altissima.
Black locust	Robinia pseudoacacia.
Tulip Tree	Liriodendron tulipifera.

Lime Tree	<i>Tilia vulgaris</i> or <i>T. platyphylles</i> .
Almond	<i>Prunus amygdalus</i> .
Box	<i>Buxus sempervirens</i> .
Chestnut	<i>Castanea sativa</i> .
Horse chestnut	<i>Acaculus Hippocastanum</i> .
Californian buckeye	<i>A. californica</i> .
Judas Tree	<i>Cercis siliquastrum</i> .
Canadian Juneberry	<i>Amelanchier canadensis</i> .
Koelreuteria	<i>K. Paniculata</i> .
Japanese Acacia	<i>Sophera japonica</i> .
Magnolia	<i>M. Grandiflora</i> .
Maple	<i>Acerapp. aceraceae</i> .
Sumac	<i>Rhus typhina</i> .
Tupelo	<i>Nyssa sylvatica</i> .
Gum	<i>Eucalyptus ficifolia</i> .
Algeroba	<i>Prosopis juliflora</i> .

WAIKATO/BAY OF PLENTY

Native trees. These are nectar bearing trees suitable for transplanting.

Rewarewa	<i>Knightea excelsa</i> ; flowers in November and gives a dark, but mild flavoured honey.
Fuschia	<i>Fuschia-excorticata</i> ; light coloured honey, spring flowering.
Pohutukawa	<i>Metrosideros excelsa</i> ; light honey. Suitable for coastal areas and inland.
Tawari	<i>Ixerba brexioides</i> ; light honey, flowers November-December.
Koromiko	<i>Hebe stricta</i> ; medium amber honey, flowers February-March.

Exotic

Pussy Willow	<i>Salix capreaea</i> ; listed as noxious weed in Waikato.
Crack Willow	<i>Salix fragilis</i> .
Lime	<i>Tilia vulgaris</i> .
Tagasaste	<i>Cytisus proliferus</i> .
Heath	<i>Erica usitanica</i> ; honey for spring feed.
False Acacia	<i>Robinia pseudoacacia</i> ; black locust.
Pepper Tree	<i>Schinus molle</i> ; a South American tree, flowers January early February. Bees greatly attracted to it.
Coral Tree	<i>Erythrina crista</i> , <i>E. galli</i> and <i>E. indica</i> ; summer flowering. Bees greatly attracted to it. Unable to indicate type of honey produced. Bloom somewhat like Red Kowhai. Fairly hardy and grows rapidly.
<i>Eucalyptus ficifolia</i>	Crimson flowering gum; flowering period January-February.
<i>Eucalyptus saligna</i>	Flowers in August and September, white flowers.

TARANAKI/MANAWATU

Native trees are often favoured for the dual purpose of preventing soil erosion and nectar yielding in preference to Australian gum trees. The nectar from these sources

is more likely to be valuable for maintaining colonies in the spring than for producing surplus honey.

There is an abundance of undergrowth vines and creepers, many of which are nectar bearing, which are fostered by native trees. This is not so in a plantation of gum trees. There is only one gum tree recommended, and that to be planted at the edge of the bush.

Gum Tree	<i>Eucalypti campbellii</i>
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Native trees

Rata	<i>Metrosideros robusta</i> .
Pohutukawa	<i>Metrosideros excelsa</i> .
Wineberry	<i>Makomako aristotelia serrata</i> .
Whitey-wood	<i>Mahoe. Melicytus ramiflorus</i> .
Kowhai	<i>Sophora microphylla</i> .
Koromiko	<i>Veronica</i> .
Kamahi	<i>Weinmannia racemosa</i> .
Kotukutuku	New Zealand tree fuchsia. <i>Fuchsia excorticata</i> .
Lacebark	<i>Hoheria populnea</i> .
Fivefinger	<i>Pseudopanax arboreus</i> .
Karo	<i>Pittosporum crassifolium</i> .
Tarata	<i>Pittosporum eugenioides</i> .
NZ Honeysuckle	Rewarewa or <i>Nighttia excelsa</i> .

Exotic trees

Tree Lucerne	<i>Cytisus proliferus albus</i> .
Barberry	<i>Berberis glaucocarpa</i> .

Willows

Pussy Willow	<i>Salix capreaea</i> .
Crack Willow	<i>Salix fragilis</i> .

There are also many exotic trees which yield nectar, but care should be exercised to see that, if trees are planted in mass, it should not generally alter the fine flavour of our honey.

HAWKES BAY-EAST COAST NORTH ISLAND

The following list of trees contains some of the most valuable nectar bearing trees suitable for planting by the State Forest Service, River Control Councils etc.:

Willow	<i>Salix fragilis</i> , <i>Salix babylonica</i> , and <i>Salix capreaea</i> .
Kowhai	<i>Sophora microphylla</i> .
Kotukutuku	<i>Fuschia excorticata</i> .
Pohutukawa	<i>Metrosideros excelsa</i> .
North Island Rata	<i>Metrosideros robusta</i> .
Tawari	<i>Ixerba brexioides</i> .
Cabbage Trees	<i>Cordyline australis</i> .
Five Fingers	<i>Pseudopanax arboreus</i> .
Titoki	<i>Alectyon excelsus</i> .
Acacia	Flowering varieties, mainly for pollen.
Hinau	<i>Elaeocarpus dentatus</i> .

CANTERBURY

The following is a list of trees which are of some economic importance to beekeeping, and could perhaps be suitable for soil conservation and river control purposes in the Canterbury district.

Natives

Mako mako	<i>Aristolis serrata</i> .
Kaka Beak	<i>Clianthus puniceus</i> .
Cabbage Tree	<i>Cordyline australis</i> .
Kotukutuku	<i>Fuschia excorticata</i> .
Rewa rewā	<i>Knightia excelsa</i> .
Rata	<i>Metrosideros robusta</i> .
Kowhai	<i>Sophora microphylla</i> .
Veronicas	Various.
Lacebark	<i>Hoheria</i> .

Others

Wattles	Various.
Barberry	<i>Berberis glaucocarpa</i> .
Gums	Various.
Willows - Weeping	<i>S. babylonica</i> .
Pussy	<i>S. capreaea</i> .
Crack	<i>S. fragilis</i> .
Tagasaste	<i>Proliferus cytisus</i> .

OTAGO/SOUTHLAND

The variety of vegetation that would be of use to the NZ Forest Service, catchment boards and others, is more limited than in warmer latitudes, but this list of native and exotic shrubs and trees may be suitable in Southland and Otago.

Horse Chestnut	<i>Acaculus hippocastanum</i> .
Japanese acacia	<i>Sophora japonica</i> .
Kowhai	<i>Sophora microphylla</i> .
Kamaha	<i>Weinmannia racemosa</i> .
Lime	<i>T. platyphyllos</i> , <i>T. maximo</i> , <i>T. Americana</i> .
Hybrid Lime	<i>T. Orbicularis</i> .
Miro	<i>Podocarpus ferrugineus</i> .
Sycamore	<i>Acer pseudo-platanus</i> .
Lowland Ribbonwood	<i>Gaya lyalli</i> .
Laburnam	<i>Laburnam Vulgarii</i> .
Rewa rewā	<i>Knightia excelsa</i> .
Rata	<i>Metrosideros robusta</i> .
Veronicas	Various.
Willows	Golden, straight and pussy.
Wattle	Cootamundra and black (<i>Baileyana</i> and <i>Decurrens</i>).
Gum trees.	

Tree lucerne and weeping willow do not generally survive in these parts, but *Berberis Darwinii* will also be attractive to tuis.

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<i>Coprosma lucida</i>	16	Flax	25
<i>Cordyline australis</i>	25	Flowering currant	14
<i>Coriaria arborea</i>	22	<i>Foeniculum vulgare</i>	38
<i>Coriaria sarmentosa</i>	22	Fox glove	20
<i>Corokia cotoneaster</i>	19	<i>Freycinetia banksii</i>	18
<i>Corynocarpus laevigatus</i>	16	Fumitory	18
Crack willow	16	<i>Fumaria officinalis</i>	18
<i>Crataegus oxyacantha</i>	17	<i>Fumaria muralis</i>	18
<i>Crepis capillaris</i>	23	<i>Fuchsia excorticata</i>	15
Crimson clover	22		
Crimson rata vine	13	G	
<i>Cryptostemma calendula</i>	13	<i>Galega officinalis</i>	34
Cultivated fruits	12	<i>Gaultheria antipoda</i>	19
<i>Cyathodes fraseri</i>	15	<i>Geniostoma ligustrifolium</i>	14
<i>Cyathodes juniperina</i>	19	<i>Geranium dissectum</i>	21
<i>Cytisus proliferus</i>	7	Giant groundsel	40
		Goatsrue	34
D		Golden wattle	10
<i>Dacrycarpus dacrydioides</i>	10	Gooseberries	31
<i>Dacrydium cupressinum</i>	10	Gorse	23
Daisy	25	<i>Griselinia littoralis</i>	19
Dandelion	23	<i>Griselinia lucida</i>	18
<i>Digitalis purpurea</i>	20	Gum manna	41
<i>Discaria toumatou</i>	31	Gum peppermint	41
<i>Dodonaea viscosa</i>	21	Gum scarlet	39
<i>Dracophyllum spp.</i>	33	Gum tasmanian blue	13
<i>Dysoxylum spectabile</i>	6		
		H	
E		Haekaro	21
<i>Echium vulgare</i>	38	Hairy lotus	30
<i>Elaeagnus</i>	41		

Hakea <i>acicularis</i>	6	Karaka	16
Hakea <i>saligna</i>	24	Karamu	16
Hakea spiny	6	Karo	20
Hange hange	14	Kauri	10
Hawkbit	23	Kauri grass	36
Hawksbeard	23	Kawaka	10
Hawkweed	23	Kie kie	18
Hawkweed mouse-eared	23	<i>Knightsia excelsa</i>	26
Hawthorn	17	Knot grass	34
Heath, bronze	15	Kohekohe	6
Heath, pink	7	Kohia	19
Heath, spanish	7	Kohuhu	21
Heather	26	Konini	15
<i>Hebe speciosa</i>	33	Koromiko	32
<i>Hebe stricta</i>	32	Koru	13
Hedge acacia	10	Kotukutuku	15
Hedge mustard	22	Kowhai	8
Hedgehog parsley	17	Kowharawhara	36
<i>Heimerliodendron brunonianum</i>	7	Kumarahou	18
Heketara	17		
<i>Helianthus annuus</i>	40	L	
Hemlock	32	Lacebark	2
<i>Hieracium pilosella</i>	23	Lancewood	39
Himalayan honeysuckle	16	Lantana	27
Hinau	27	<i>Lantana camara</i>	27
Honeysuckle, Himalayan	16	Laurel	19
Honeysuckle, New Zealand	26	<i>Laurelia novae-zelandiae</i>	24
Horehound	34	Lemonwood	15
Horoeka	40	<i>Leontodon taraxacoides</i>	23
Horopito	15	<i>Leptospermum ericoides</i>	38
Houhere	6	<i>Leptospermum scoparium</i>	8
<i>Hoheria lyallii</i>	6	<i>Leycesteria formosa</i>	16
<i>Hoheria populnea</i>	6	<i>Libocedrus plumosa</i>	10
<i>Hypericum androsaemum</i>	18	<i>Ligustrum chinense</i>	34
<i>Hypericum humifusum</i>	13	<i>Ligustrum vulgare</i>	18
<i>Hypochoeris radicata</i>	39	Lime	35
		Ling heather	26
I		<i>Litsea calicularis</i>	15
Inkweed	38	Loosestrife	31
<i>Ixerba brexioides</i>	26	<i>Lophomyrtus bullata</i>	29
		<i>Lophomyrtus obcordata</i>	29
J		<i>Lotus angustissimus</i>	30
Jointed Charlock	23	<i>Lotus corniculatus</i>	30
		<i>Lotus pedunculatus</i>	29
K		Lotus major	29
Kahikatea	10	Lucerne	31
Kakaha	36	Lupin	20
Kaikomako	21	<i>Lupinus arboreus</i>	20
Kamahi	27	<i>Lycium horridum</i>	40
Kanuka	36	<i>Lythrum salicaria</i>	31

M	
Mahoe	27
Maire	20
Mairehau	24
Maire tawake	7
Makaka	18
Makomako	19
Mallow	18
<i>Malva silvestris</i>	18
Mangeao	15
Mangrove	6
Manatu	17
Manawa	6
Manna gum	41
Manuka	8-38
Maori dock	33
<i>Marrubium vulgare</i>	34
Matagouri	31
Matai	10
Mealy	39
<i>Medicago hispida</i>	41
<i>Medicago lupulina</i>	24
<i>Medicago sativa</i>	31
<i>Muehlenbeckia australis</i>	30
<i>Muehlenbeckia axillaris</i>	30
<i>Melandrium album</i> —see <i>Silene alba</i>	25
<i>Melicope simplex</i>	17
<i>Melicope ternata</i>	15
<i>Melicytus ramiflorus</i>	27
<i>Melicytus lanceolatus</i>	27
<i>Melilotus</i> spp.	28
<i>Mentha pulegium</i>	39
<i>Mentha viridis</i>	40
<i>Metrosideros albiflora</i>	33
<i>Metrosideros carminea</i>	13
<i>Metrosideros diffusa</i>	32
<i>Metrosideros excelsa</i>	30
<i>Metrosideros fulgens</i>	32
<i>Metrosideros perforata</i>	39
<i>Metrosideros robusta</i>	24
<i>Metrosideros umbellata</i>	28
Milk tree	27
Milk thistle —see sow thistle	25
Mingimingi	19
Mint	40
Miro	10
Monoao	33
Morning glory —see bindweed	20
Mountain ribbonwood	6
Mouse-eared chickweed	25
Mouse-eared hawkweed	23
<i>Myoporum laetum</i>	20
<i>Myosotis spathulata</i>	33

N

Nahinahi	20
Napuka	32
Native broom	18
Native forget-me-not	33
Native rock lily	30
<i>Nestegis cumminghamii</i>	20
New Zealand honeysuckle	26
Ngaio	20
<i>Nicotiana tabacum</i>	39
Nikau	32

O

<i>Olearia furfuracea</i>	13
<i>Olearia rani</i>	17
Ongaonga	34
Oxalis	27
<i>Oxalis cernua</i>	14
<i>Oxalis corniculata</i>	27

P

Papauma	19
Parapara	7
<i>Paratrophis microphylla</i>	27
<i>Parentucellia viscosa</i>	29
Patotara	15
Patterson's curse	38
<i>Pennantia corymbosa</i>	21
Pennyroyal	39
Peppermint gum	41
<i>Persoonia toru</i>	32
<i>Phebalium nadum</i>	24
<i>Phormium tenax</i>	25
<i>Phytolacca octandra</i>	38
Pigwood	14
<i>Pimelea longifolia</i>	21
<i>Pimelea tomentosa</i>	21
Pink heath	7
<i>Pittosporum crassifolium</i>	20
<i>Pittosporum eugenioides</i>	15
<i>Pittosporum tenuifolium</i>	21
<i>Pittosporum umbellatum</i>	21
<i>Plagianthus betulinus</i>	17
Poataniwha	17
<i>Podocarpus ferrugineus</i>	10
<i>Podocarpus spicatus</i>	10

<i>Podocarpus totara</i>	10
Pohue	20
Pohutukawa	30
Pokaka	27
<i>Polygonum aviculare</i>	34
<i>Polygonum capitatum</i>	34
<i>Polygonum persicaria</i>	23
<i>Pomaderris kumaraho</i>	18
<i>Pomaderris phyllicifolia</i>	16
<i>Pontentilla anserina</i>	40
Poroporo	22
Prickly leaved hedge wattle	10
Prickly sow thistle	25
Privet	18
Privet Chinese	34
<i>Prunus laurocerasus</i>	19
<i>Pseudopanax arboreus</i>	12
<i>Pseudopanax crassifolius</i>	40
<i>Pseudowintera axillaris</i>	15
<i>Psoralea pinnata</i>	28
Puka	18
Pukatea	24
<i>Pultenaea daphnoides</i>	28
Puriri	8
Pussy willow	16
Putaputaweta	22
Puwaha	25

Q

<i>Quintinia serrata</i>	26
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R

Radiata pine	10
Ragwort	33
Ramarama	29
Rangiora	13
<i>Ranunculus</i> spp.	14
Rape	22
<i>Raphanus raphanistrum</i>	23
Raspberry	31
Rata, crimson vine	13
Rata northern	24
Rata southern	28
Rata vines	32
Rauriki	25
Red campion	25
Red clover	32
Red shank	23
Rewarewa	26
<i>Ripogonum scandens</i>	30
<i>Rhopalostylis sapida</i>	32
Ribbonwood	17
<i>Ribes glutinosum</i>	14
<i>Ribes grossularia</i>	31
Rimu	10
<i>Robinia pseudoacacia</i>	21
Rock lily	30
Rohutu	29
<i>Rosa</i> spp.	23
Rough clover	22
<i>Rubus australis</i>	14
<i>Rubus cissoides</i>	14
<i>Rubus fruticosus</i>	31
<i>Rubus idaeus</i>	31
<i>Rumex acetosa</i>	33
<i>Rumex flexuosus</i>	33

S

<i>Salix babylonica</i>	17
<i>Salix capraea</i>	16
<i>Salix fragilis</i>	16
<i>Sand convolvulus</i>	18
<i>Sarothamnus scoparius</i>	14
<i>Sarothamnus racemosus</i>	14
Scarlet gum	39
Scarlet pimpernel	17
<i>Senecio jacobaea</i>	33
<i>Senecio sylvaticus</i>	40
Shepherd's purse	14
<i>Silene alba</i>	25
<i>Silene divica</i>	25
Silver weed	40
Silver wattle	10
<i>Sinapis arvensis</i>	23
<i>Sisymbrium officinale</i>	22
Snowberry	19
<i>Solanum aviculare</i>	22
<i>Sonchus asper</i>	25
<i>Sonchus oleraceus</i>	25
<i>Sophora microphylla</i>	8
<i>S. tetraptera</i>	5
Sorrel	33
Southern rata	28
Sow thistle	25
Sow thistle prickly	25
Spanish heath	7
Speedwell	12
<i>Spergula arvensis</i>	20
Spider wood	33
Spiderwort	16

Spiny hakea	6	<i>Trifolium subterraneum</i>	22
Spurrey	20	Tumatakuru	31
<i>Stellaria media</i>	25	Turepo	27
Stinging nettle	34	Turnip	24
Strawberry clover	6	Turnip wild	16
Stringbark	39	Tutsan	18
Subterranean clover	22	Tutu	22
Sunflower	40		
Sunshine wattle	10		
Supplejack	30		
Sweet clover	28		

T

Tagasaste	7
Taraire	21
Taramea	30
Taranga	21
Tarata	15
<i>Taraxacum officinale</i>	23
Tar weed	29
Tasmanian blue gum	13
Tataramoa	14
Tauhinu	16
Taupuka	19
Tawa	19
Tawari	26
Tawheowheo	26
Tawhero	39
Tea tree	8-38
<i>Tetrapathaea tetrandra</i>	19
Thistles	34
Thyme	40
<i>Thymus vulgaris</i>	40
Ti-kouka	25
<i>Tilia spp.</i>	35
Titoki	27
Tobacco	39
<i>Torilus nodosa</i>	17
Toro	32
Toropapa	17
Totara	10
Towai	39
Trailing St. John's wort	13
Tree manuka	38
Tree lucerne	7
<i>Trifolium fragiferum</i>	6
<i>Trifolium incarnatum</i>	22
<i>Trifolium pratense</i>	32
<i>Trifolium repens</i>	29
<i>Trifolium scabrum</i>	22

U

<i>Ulex europaeus</i>	23
<i>Urtica ferrox</i>	34

V

<i>Veronica arvensis</i>	12
Veronica's woody	32
Vipers bugloss	38
<i>Vitex lucens</i>	8

W

Waoriki	14
Wattle, black	10
Wattle, brush	6
Wattle, coastal	10
Wattle, cootamundra	10
Wattle, golden	10
Wattle, hedge	10
Wattle, prickly leaved hedge	10
Wattle, sunshine	10
Wattle, silver	10
Weeping willow	17
<i>Weinmannia racemosa</i>	27
<i>Weinmannia silvicola</i>	39
Wharangi	15
Wharawhara	38
Whau	17
Whauwhau	12
White campion	25
White clover	29
White rata vine	33
Whitey wood	27
Wild cabbage	26
Wild garlic	28
Wild geranium	21
Wild irishman	31
Wild onion	28
Wild radish	23
Wild rose	23
Wild turnip	16
Willow, crack	16
Willow, herb	13

Willow, pussy	16
Willow, weeping	17
Wineberry	19
Winter cress	26
Wireweed	34
Wood sorrel	14

Y

Yarr	20
Yarrow	29

X

<i>Xanthium spinosum</i>	38
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Z

<i>Zantedeschia aethiopica</i>	12
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