



SFF 10/009 Trees for Bees: Results

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Ministry for Primary Industries
Manatū Ahu Matua



Sustainable Farming Fund

National Beekeepers' Conference
Ashburton June 19th 2013

Gisborne
Eastwoodhill
National Arboretum of New Zealand



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History of Trees for Bees Phase 1

Thanks to Linda and Roger Bray



- 1915** Barker of Canterbury Beekeepers Assoc. native plants for bees
- 1916** Cockayne on native and introduced plants for bees
- 1932** Gibb and 1934 Peterson on native and exotic plants for bees
- 1950** NBA asked Horticulture Division for list of plants for bees
- 1962** Gumbrell [“Trees for Bees”](#) for NZFAA on pollen dearth problem
- 1967** Walsh published “NZ Pollen and Nectar Sources”

History of Trees for Bees Phase 2

Thanks to Linda and Roger Bray



1973 NZ Beekeeper on Possum/deer browse West Coast rata, kamahi

1973 Ramsay **Trees for Bees** in Otago and Southland

1982 Matheson, MAF, weed problem - need nectar and pollen sources

1982 Bryant promotes artificial bee feed

1980's

Van Eaton, Agriculture Advisory Officer, weed removal & dearth

Alan McCaw, President NBA **Trees for Bees** tags in nurseries

1995 Butz Huryn publishes Native Plants used by bees

2009 Federated Farmers Bee Plant Guides **Trees for Bees**

2010 SFF Project 10/009 Flowers for Healthy Bees by BFFG

2013 SFF Project 13/015 Producing Abundant Pollinators by BFFG

National Plant Pest Accord

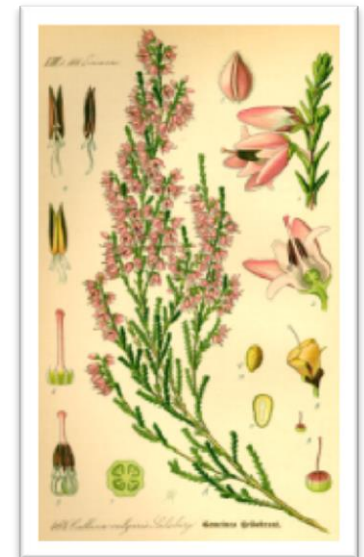
Common name	Latin name
Crack Willow	<i>Salix fragilis</i>
Grey Willow	<i>Salix cinerea</i>
Lantana	<i>Lantana camara</i>
Scottish Heather	<i>Calluna vulgaris</i>



Salix fragilis



Salix cinerea



Calluna vulgaris

Willow (*Salix* sp) – variable **13 to 24%** protein



Regional Plant Pest Management

Common name	Latin name	No. of Regional BeePlantGuides
Gorse	<i>Ulex europaeus</i>	10
Scotch Broom	<i>Cytisus scoparius</i>	10
Blackberry	<i>Rubus fruticosus</i>	7
Spanish Heath	<i>Erica lusitanica</i>	5
Barberry	<i>Berberis darwinii</i> & <i>B. glaucocarpa</i>	4
Butterfly-bush	<i>Buddleja davidii</i> & <i>dysophylla</i>	4
Hawthorn	<i>Crataegus monogyna</i>	4
Privet	<i>Ligustrum sinense</i>	3
Himalayan Honeysuckle	<i>Leycesteria formosa</i>	2
Sycamore	<i>Acer pseudoplatanus</i>	2
Cherry Laurel	<i>Prunus laurocerasus</i>	1
Flowering Currant	<i>Ribes sanguineum</i>	1
Thyme	<i>Thymus vulgaris</i>	1

Gorse (*Ulex europaea*)

- Gorse flowers autumn and spring
- Protein 17 to 28% (data from Somerville 2005)



Broom (*Cytisus scoparius*)

- Broom flowers early spring
- Protein from 33 to 39 % (our data)



Hawthorn (*Crataegus monogyna*)



Photo: Jean-Noël Galliot
© Landcare Research



Photo : Jean-Noël Galliot
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Hawthorn (*Crataegus monogyna*)



Photo : Jean-Noël Galliot
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Sycamore maple (*Acer pseudoplatanus*)



Photo : Jean-Noël Galliot
© Landcare Research



Photo : Jean-Noël Galliot
© Landcare Research

***Sycamore maple* (*Acer pseudoplatanus*)**



Cherry Laurel (*Prunus laurocerasus*)



Photo : Jean-Noël Galliot
© Landcare Research



Photo : Jean-Noël Galliot
© Landcare Research

Thyme under RPPMS in Canterbury



Photo by Finn Scheele © Landcare Research

Solution: Restore Lost Flowers

1. Diversity
2. Protein
3. Quantity

Trees for Bees Program started in 2009 Fed Farm BIG

www.treesforbeesnz.org



THE FUTURE OF FARMING IS
RELIANT ON ALL FARMERS
PLAYING THEIR PART IN
PROTECTING THE HONEY BEE.

WHY ARE HONEY BEES IMPORTANT?

FOR YOUR REGIONAL PLANT GUIDE

Download a PDF from our website.
www.fedfarm.org.nz/ourcampaigns

Or request a plant guide by contacting:
Shona Sluys - Email ssluys@fedfarm.org.nz
Phone 0800 327 648
Fax 04 473 1081



*Trees
For
Bees*



Expanded Bee Plant List

240 Walsh 1967 *Nectar and Pollen Sources of NZ*

140 Butz-Huryn 1995 *Native plant species*

89 Jeffs 1983 *Community tree planting program*

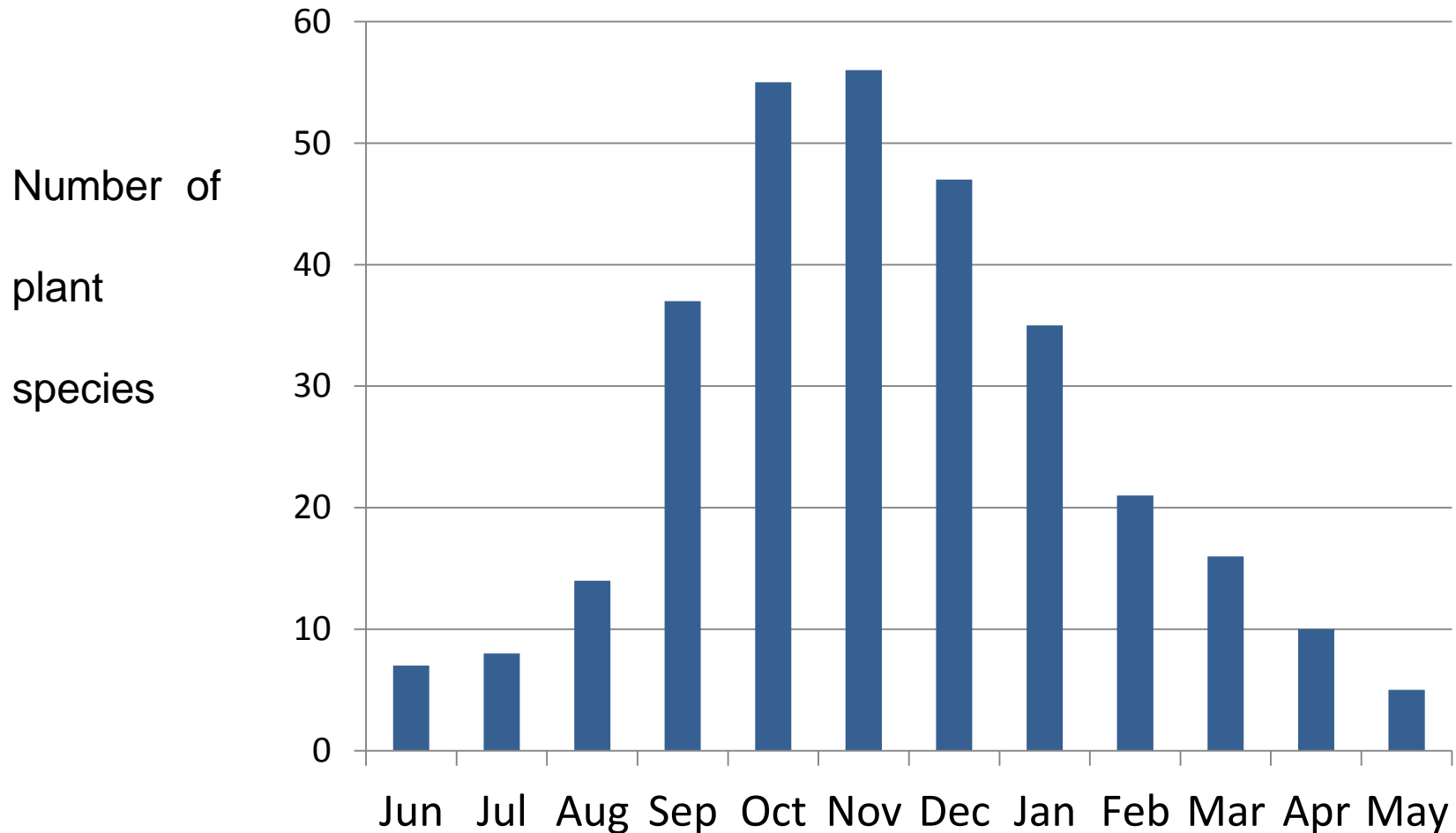
78 Matheson 1984 *Practical Beekeeping in NZ*

TOTAL SPECIES ALL COMBINED = **343 Bee Plants**

Plants Selected for Bee Plant Guides

- Evaluated by 18 expert beekeepers
- Weeds eliminated (NPPA and RPPMS)
- Ranked for each of 10 regions
- Filtered for farm practicality (e.g., no herbs)
- Validated by nurseries for the region
- **RESULTING LIST TOTAL of 90 Bee Plants**

Total Species in Flower Bee Plant Guides



From Federated Farmers Bee Plant Guides November 2009

Major Issues for Pollen Dearth

1. Gap from end of willow to beginning clover
2. Early spring build-up
3. Autumn winter preparation



The Big Three:
Gorse, Broom
and Willow

New Data from SFF 10/009

- 950 candidate species names in database
- 120 species with protein measured
- 10 species with duplicate protein N & S
- Spare pollen in freezer for other analyses
(Karen Rogers, GNS Science)

Native plant species

Native: Flax (*Phormium tenax*)



Photo by Finn Scheele
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Native: Cabbage Tree (*Cordyline fruiticosa*)



Tarata (*Pittosporum eugenoides*)



Pittosporum sp.



Photo : Jean-Noël Galliot
© Landcare Research

Five Finger (*Pseudopanax arboreus*)





Photos : Jean-Noël Galliot ©

Eastwoodhill Arboretum



Photo: John Mclean ©

Non-weedy alternatives

Cockspur hawthorn (*Crataegus crus-galli*)



Photo : Jean-Noël Galliot
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Cockspur hawthorn (*Crataegus crus-galli*)



Photo : Jean-Noël Galliot
© Landcare Research



Photo : Jean-Noël Galliot
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Portugal Laurel (*Prunus lusitanica*)



Photo : Jean-Noël Galliot
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Portugal Laurel (*Prunus lusitanica*)



Photo : Jean-Noël Galliot
© Landcare Research



Photo : Jean-Noël Galliot
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Honeysuckle (*Lonicera maackii*)



Photo : Jean-Noël Galliot
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Honeysuckle (*Lonicera maackii*)



Photo : Jean-Noël Galliot
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Translucent Honeysuckle (*Lonicera quinquelocularis*)



Photo : Jean-Noël Galliot
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Photo : Jean-Noël Galliot
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Translucent Honeysuckle (*Lonicera quinquelocularis*)



Photo : Jean-Noël Galliot
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**Common
under-valued
& under-utilised species**

Amur Maple (*Acer tataricum*)



Photo : Jean-Noël Galliot
© Landcare Research



Photo : Jean-Noël Galliot
© Landcare Research

Amur Maple (*Acer tataricum*)



Flowering Ash (*Fraxinus ornus*)



Photo : Jean-Noël Galliot
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Photo : Jean-Noël Galliot
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Flowering Ash (*Fraxinus ornus*)



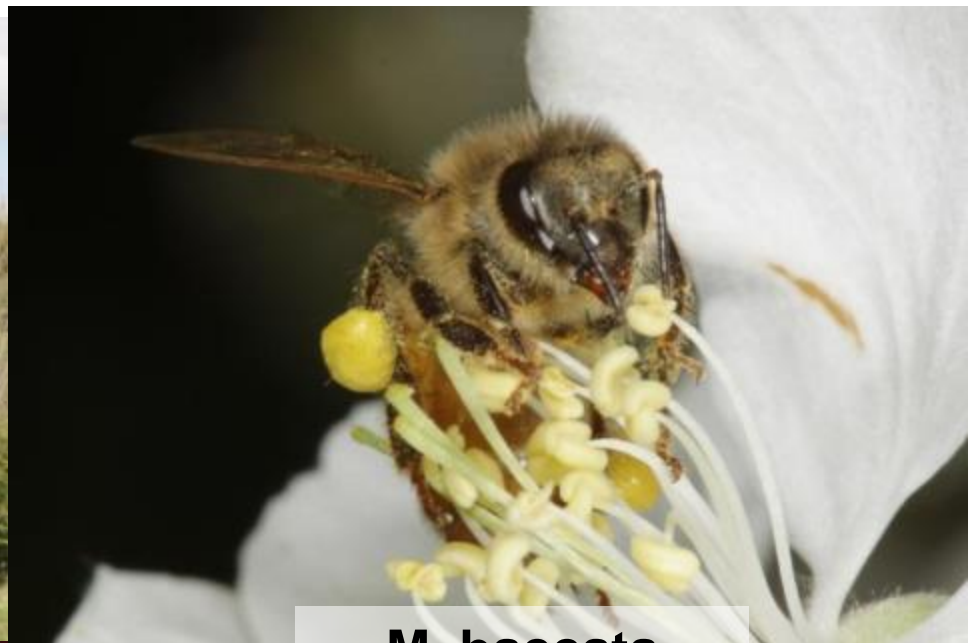
Photo : Jean-Noël Galliot
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Low-maintenance ornamental fruit trees

Apple (*Malus*)



M. astringens



M. baccata



Apple (*Malus sp.*)



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**Not found on
NZ Bee Plant Lists**

Shadbush (*Amelanchier canadensis*)



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Shadbush (*Amelanchier canadensis*)



Photo : Jean-Noël Galliot
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Deciduous holly (*Ilex macrocarpa*)



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Photo: Jean-Noël Galliot
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Deciduous holly (*Ilex macrocarpa*)



Photo: Jean-Noël Galliot
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Mountain Dogwood (*Cornus nuttallii*)



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Photo : Jean-Noël Galliot
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Mountain Dogwood (*Cornus nuttalii*)



Bladder nut (*Staphylea x elegans*)



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Bladder nut (*Staphylea x elegans*)



Bladder nut (*Staphylea x elegans*)



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**New discoveries
not yet on
international
bee plant lists**

Kei bottlebrush (*Greyia flavanagarii*)



Photo: Jean-Noël Galliot
© Landcare Research

Kei bottlebrush (*Greyia flanaganii*)



Photo: Jean-Noël Galliot
© Landcare Research



Photo by Jean-Noël Galliot
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Toxic Plants

(bees, animals, humans)

Horse Chesnut (*Aesculus Hippocastanum*)



Photo : Jean-Noël Galliot
© Landcare Research



Photo: Jean-Noël Galliot
© Landcare Research

Horse Chesnut (*Aesculus hippocastanum*)

TOXIC TO BEES



Quantity of Pollen

Box elder (*Acer negundo*)



Photo: Jean-Noël Galliot
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Box elder (*Acer negundo*)



Photo : Jean-Noël Galliot
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Photo : Jean-Noël Galliot
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Oaks

(Quercus spp)

- Volume pollen
- Vertical rise

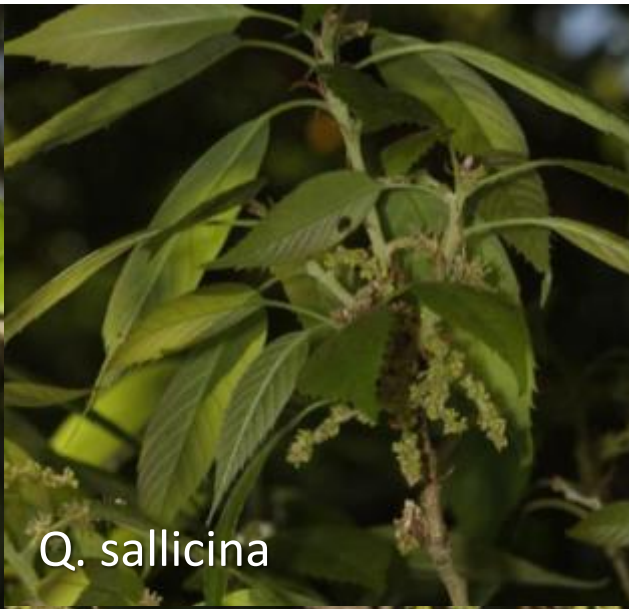


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Oaks (*Quercus* spp.)



Q. robur



Q. salicina



Q. laeta



Q. canariensis



Q. mongolica



Q. crassifolia

Oaks (*Quercus* sp)



Q. laeta



Q. mongolica



Q. canariensis



Q. robur

Photos : Jean-Noël Galliot
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Mexican Oak (*Quercus candicans*)



Photo : Jean-Noël Galliot
© Landcare Research

Mexican Oak (*Quercus candicans*)



Mexican Oak (*Quercus candicans*)



Photo : Jean-Noël Galliot
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Photo : Jean-Noël Galliot
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Willow (*Salix sp*)

Are we using
the best
species for
erosion control
or riparian?



Photo : Jean-Noël Galliot
© Landcare Research

Willow (*Salix sp*)



Photo : Jean-Noël Galliot
© Landcare Research

Willow (*Salix* sp)



Preliminary Willow Flowering

[illegible]



Conclusions

Pollen dearth is an **artefact**
of low diversity on farms and public lands

Have we solved pollen dearth?

1. Willow -- Clover Gap ----- YES !
2. Early Spring dearth ----- Partly!
3. Autumn dearth ----- More work needed
4. The Big Three -- ----- Not yet, not sure