



Selecting native plants that attract beneficial insects: A Canterbury Guide



“Modern agriculture has relied heavily on pesticides and introduced species, often overlooking the quiet work of our native insects. Yet many are powerful allies, pollinating crops and naturally controlling pests.

This guide invites farmers, scientists, and tree planters to re-imagine what is possible, to design native plantings that support beneficial insects, build resilience, and help restore Canterbury's living landscapes.

– Brad Howlett, Bioeconomy Science Institute

Beneficial insects are insects that provide useful services, such as pollination, pest control and nutrient cycling, contributing to both economic and environmental benefits for farmers.

This plant guide was developed from knowledge generated through the Biodiversity for Beneficial Insects: Designing Native Plantings for Beneficial Insects programme (October 2021–October 2026). The programme was funded by the Ministry for Primary Industries (MPI) through the Sustainable Food and Fibre Futures (SFFF) fund, with co-investment and support from Canterbury farmers, primary industry bodies, local and regional councils, conservation trusts, and experts in planting design and establishment. The research investigated how native plantings can support pollinators and natural enemies of crop pests, with the aim of developing practical guidance for farmers on designing habitats that deliver both environmental and economic benefits.

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The content in this guide has been developed specifically for farmers and landowners in Canterbury with input from researchers, industry partners, and local growers. We gratefully acknowledge the contributions of our partner organisations and John Evans (Canterbury farmer & native forester).



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Planting natives for the future of Canterbury farming

Across Canterbury, farmers are already finding new ways to make better use of the land they have — strengthening production systems while working with, rather than against, the natural environment.

“

The real question is not whether native insects belong in our farms — but why we haven't yet made space for them.

— Brad Howlett, Project Leader

Planting native species around paddocks, waterways, and lower-yield areas is part of that shift. These plantings can support pollination, help manage insect pests, and build more resilient farming systems over time — often without taking productive land out of use.

“

The native planting attracts the good bugs... we don't have to spray as much.

— John Evans, Canterbury farmer & native forester

Looking ahead, widespread adoption of native plantings has the potential to reshape how Canterbury farms function. More diverse insect populations can provide reliable pollination across seasons and conditions, while natural pest control reduces reliance on chemical inputs. Farms become more resilient to change.

“

Native biodiversity plantings on farm make good sense. They provide shelter, reduce erosion, support social licence, and build resilience [...]. They also enhance underused corners of the farm and improve overall appearance.

— Abie Horrocks, FAR

Native plants can be a lower-risk way to support beneficial insects, because they provide food and shelter for pollinators and natural enemies, while being less likely than many exotic plants to host common crop pests⁽⁸⁾.

Podcast | Native plantings boost crop yields

(June 2025)

In this episode of Cut the Crop, scientist Brad Howlett and retired Mid-Canterbury arable farmer John Evans discuss the role native plants play in supporting pollinating insects.

Video link: [Native plantings boost crop yields | Videos & Movies on Vimeo](#)



Podcast link: [Native plantings boost crop yields | Podcasts](#)



Sourced from: Foundation for Arable Research (FAR) - Cut the Crop! podcast & video series

Video | Beneficial Insects

(July 2024)

Hear an overview of the advances in the programme from Dr Brad Howlett, science lead, Foundation for Arable Research (FAR) environmental research leader Abie Horrocks and Craig Pauling of Te Ara Kākāriki.

Video link: [Rural Delivery](#)



Sourced from: Rural Delivery television series airing on TVNZ

Why native plants matter in Canterbury

Canterbury is recognised as one of 25 globally important biodiversity areas due to its unique range of native species⁽¹⁾, yet less than 0.5% of the original native vegetation remains on the Canterbury Plains⁽²⁾. Many systems now rely heavily on managed honey bees for pollination and insecticides for pest control. Our research in Canterbury shows this doesn't have to be the case.

Native bees and flies can be just as effective as honey bees for pollination⁽³⁾. Insects such as ladybirds, hover flies, lacewings, and parasitoid wasps can reduce pest numbers — if a suitable native habitat is available to support them⁽⁴⁾.

Supporting beneficial insects can pay off:

- improved pollination could add up to \$39.9 million each year to Canterbury crop production⁽⁵⁾
- removing just one insecticide spray per farm per year could save \$24.1 million across the region⁽⁵⁾.

Relying on a narrow set of solutions for pollination and pest control can leave farms vulnerable. Supporting a wider range of beneficial insects helps build more resilient farming systems, where different species can step in under changing conditions⁽⁶⁾.

“When we put native vegetation back, we rebuild habitats for the insect life.

— Stephen Brailsford, Brailsfords Ltd.

This approach has been tested across Canterbury farms and represents one of the most comprehensive regional studies of native plants and beneficial insects undertaken in the Southern Hemisphere.

Canterbury farmers and landowners are already planting native species around crops, paddocks, waterways, and wetlands. Establishing areas of native plants is not about taking productive land out of use, but about making better use of farm margins, edges, and lower-yield areas to deliver multiple benefits. These benefits can include supporting pollination and natural pest control, protecting waterways, reducing erosion, providing shelter and shade, storing carbon, improving biodiversity, and strengthening farm resilience.

The experiences of local farmers who are introducing native plantings to their sites are shared later in this guide through survey results and case studies.

“Think beyond your farm gate. Connected plantings can create wider regional corridors for beneficial insects and native wildlife.

— Mike Arnold, LeaderBrand

About this guide

This guide has been designed as a practical, Canterbury-based tool to support farmers and landowners in selecting flowering native plants to suit their specific site, that will attract beneficial insects that contribute to productive outcomes.

Inside this guide you will find:

- why beneficial insects matter on farms
- which insects to encourage
- which native plants will attract the insects you need
- guidance on selecting plants to suit your site
- guidance on flowering times and plant diversity
- survey results from Canterbury farmers and rural landowners who have planted natives
- case studies from local Canterbury farmers and growers who have planted natives

Beyond initial plant identification, it is essential that readers engage with a native plant expert/nursery to make a planting and investment plan that can be implemented as time and cash flow allow. While some farmers may have the budget to establish plantings on a large scale, starting small and working at a pace that suits your time and budget can still make a meaningful difference over time. Farmers and land managers face many competing financial and time pressures and establishing native plantings may not always be an immediate priority. Native planting does not need to happen all at once — many successful plantings are developed gradually over several years. Starting with a well-considered planting plan, developed with expert advice, helps ensure that even small areas planted over time work together to support pollination, natural pest control and increased insect diversity across your farm.

“**Start small and build over time, planting awkward corners, wet patches, and edges and linking areas gradually rather than trying to do big blocks.**

— John Evans, Canterbury farmer & native forester

“**Use funding programmes to scale up planting without carrying the full cost.**

— Carey Barnett, Canterbury farmer



Podcast | Fresh findings on beneficial insects

(November 2023)

Podcaster and scientist Dr Tom Moore speaks to Entomologist Brad Howlett who provides an update on research findings which confirm the importance of native plantings in encouraging pollinating insects, and allows us to design plantings based on the best insect species to attract for any particular farm.

Podcast link: [Fresh findings on beneficial insects • Plant & Food Research](#)



Sourced from: Bioeconomy Science Institute (Bioeconomy Science Institute) Scigest podcast series

The Biodiversity for Beneficial Insects research programme

The Biodiversity for Beneficial Insects research programme is a multi-year initiative funded through the Ministry for Primary Industries' Sustainable Food and Fibre Futures (SFF Futures) fund, in partnership with The New Zealand Institute for Bioeconomy Science Limited* (Bioeconomy Science Institute) and a range of industry co-investors. These partners include Brailsfords Ltd., Foundation for Arable Research (FAR), John Evans and Kai Tegels, Landcorp Farming Ltd. (now Pāmu), Southern Pastures Ltd., Beef + Lamb New Zealand, Synlait Milk Ltd., and Te Ara Kākāriki Greenway Canterbury Trust, Environment Canterbury Regional Council, and Selwyn District Council, reflecting strong collaboration across the Canterbury farming and growing sector.

The programme commenced in October 2021 and ran for 5 years, with research activities and milestones scheduled through to 2026. It has combined field-based research across Canterbury with on-farm trials and active participation from growers, alongside engagement with industry and community groups to ensure the work remains grounded in practical application. Recognising native plant species as taonga** in Aotearoa New Zealand, Māori advisors supported the programme, and elements of mātauranga Māori are included in this guide to reflect their cultural significance and traditional uses.

The core objective of the programme was to better understand the relationship between native plant species and beneficial insects, including pollinators and natural enemies of crop pests. This knowledge was used to develop practical guidance for designing native plantings that support these insects within productive farming systems. The programme also aimed to demonstrate how integrating native vegetation into farm landscapes can enhance ecosystem services such as pollination and biological pest control, while contributing to more resilient and sustainable agricultural systems over time.

* The Bioeconomy Science Institute was formed in 2025, bringing AgResearch, Manaaki Whenua – Landcare Research, Plant & Food Research and Scion into a single organisation

** Taonga (species): a plant or animal that is treasured by Māori for its cultural, spiritual, or environmental importance. The word taonga means "treasure," and these species are valued not just for their role in nature, but for their deep connections to identity, traditions, and wellbeing

Who this guide is for

This guide is primarily aimed at Canterbury-based commercial arable, cropping, horticultural, and pastoral livestock farmers (dairy, sheep, beef, deer). However, the information is also relevant to other landowners, farmers, catchment groups, lifestyle block holders, organic farmers, schools, home gardeners, native plant growers and anyone with an interest in native plantings or encouraging the integrated use of beneficial insects in their area.

Planting natives contributes many functional and aesthetic benefits, such as: beautification, providing shade and shelter, stabilising ground against erosion, reducing nutrient run-off and increasing biodiversity on-farm. The focus of this guide is on planting flowering natives to attract insects that will benefit plants and crops on your site.

Specifically, you will find useful information about planting flowering natives in Canterbury to:

- make better use of paddock edges, margins, waterways and other less productive areas.
- improve pollination.
- support natural pest control and reduce insect pest pressure.

The recommendations in this guide apply to the Canterbury region because the research that backs this guidance was carried out on Canterbury farms, with local farmers. For this reason, the guidance cannot be reliably applied to other regions of Aotearoa New Zealand, where conditions, insects and crops are different.

In reading this guide you will learn about the native plants that could help you build diverse beneficial insects that will pollinate crops and control insect pests on your land. Many of our flowering native plant species support beneficial insects⁽⁷⁾, but choosing the right mix of plants and insects helps you achieve the greatest benefits⁽⁸⁾.

“Widespread planting of native species across Canterbury has the potential to create healthier, more resilient farming systems that rely less on chemical inputs while remaining productive.

— Sarah Mason, Synlait Milk



How to use this guide

This guide is designed as a practical and easy to use tool, to help you select native plants that will attract beneficial insects to your site across the year. By following through the steps shown below you will be able to identify which native plants will suit your site and your crop management needs. Treat this guide as a toolbox: use the survey and case studies provided towards the end of the guide, for real-world context, and the plant profiles to identify and better understand species that may be a good fit for your farm.

Planting natives to CONTROL INSECT PESTS on your crop(s)



Planting natives to POLLINATE your crop(s)





SECTION 1 –

Exterminating insect pests with beneficial insects

A wide range of crops are grown across Canterbury, and each crop can have a unique suite of key insect pests. Fortunately, many of these pests can be eaten by a wide range of beneficial insect species. These beneficial insects can help reduce pest populations and can be an important component of integrated pest management.

Encouraging beneficial insects can reduce reliance on insecticides while supporting healthier and more resilient farming systems. Many beneficial insects occur naturally in Canterbury landscapes and will move into crops where pests are present. Planting native vegetation nearby helps encourage more of these insects and keeps them close to where they're most needed.

Because pest problems vary between crop types, the beneficial insects that help control them also differ. The following sections group crops into major categories commonly grown in Canterbury, which report key pests associated with them and the beneficial insects known to attack them.

Crop specific guide to exterminating insect pests with beneficial insects

This section consists of seven sections as below:

1 Brassicas	Livestock forage crops (kale, turnip), seed crops (e.g. radish and pak choi), vegetable crops (broccoli, cauliflower, cabbage)
2 Cereals & corn	Cereals, grain maize (corn)
3 Pasture species	Clover, lucerne, pasture grasses
4 Pipfruit	Apple, pear
5 Berry fruits & grapes	Blueberry, currants, grape, <i>Rubus</i> (raspberry, blackberry), strawberry
6 Solanaceae	Potato, tomato
7 Vegetable crops	Bean, carrot, lettuce, onion, pea, squash

- Crops are grouped by botanical similarity, not production type. For example, pests relevant to arable production of clover seed are listed in the pasture species section.
- Find the crop table that applies to you.
- Each table lists key insect pests that damage Canterbury crops. Beneficial insects are shown across the top of the table; green boxes indicate which beneficial insects help control each pest.
- The beneficial insect factsheets in Section 4, page 41, provide more information about each insect, including photographs and notes on which pests they are most effective against.

1 Brassicas

Identify beneficial insects to manage insect pests on: livestock forage crops (kale, turnip), seed crops (e.g. radish and pak choi) & vegetable crops (broccoli, cauliflower, cabbage)

Brassicas are grown in Canterbury for livestock feed, vegetable production, oilseed crops such as oilseed rape, and seed production. Common forage types include kale, turnips, swedes, and forage rape, while vegetable crops include cabbage, broccoli, and cauliflower. A range of brassicas are also grown for seed, including radishes, Asian greens (e.g. pak choi, Chinese cabbage, Chinese kale) and other vegetable types (e.g. Brussels sprouts).

		BENEFICIAL INSECTS						
		Parasitoid wasps – ichneumonid	Parasitoid wasps – other	Bristle flies	Hover flies	Ladybird beetles	Lacewing – brown	Predatory insects ¹ , spiders & harvestmen
PESTS*	Brassica aphids							
	Cabbage whitefly							
	Diamondback moth							
	European leaf miner							
	Grass grub							
	Greasy cutworm							
	Green looper							
	Green vegetable bug							
	<i>Nysius</i> (wheat bug)							
	Slugs							
	Springtails							
	Thrips - flower & onion							
	Tomato fruitworm/Cotton bollworm moth	**						
	White butterfly							

* Pest biological names are listed in the Appendices of this document

** The pest exterminator *Echthromorpha intricatoria* is found in Canterbury but not *Netelia producta*, a key exterminator in other parts of Aotearoa New Zealand.

¹ These predators don't feed on nectar, but native plantings support them by providing habitats and alternative food sources. Predatory insects - includes beetles (e.g. carabid & rove), predatory mites and bugs (e.g. damsel, pirate & soldier bugs).

2 Cereals & corn

Identify beneficial insects to manage insect pests on: cereals, grain maize (corn)

A range of cereal crops are grown in both arable and pastoral systems across the Canterbury region. Pests can cause considerable damage to cereal crops both directly and through the transmission of yellow dwarf viruses by aphids.

	BENEFICIAL INSECTS						
	Parasitoid wasps – ichneumonid	Parasitoid wasps – other	Bristle flies	Hover flies	Ladybird beetles	Lacewing – brown	Predatory insects ¹ , spiders & harvestmen
Argentine stem weevil							
Cereal & corn aphids							
Cosmopolitan/Northern armyworm							
Fall armyworm							
Grass grub							
Greasy cutworm							
Green looper							
Green vegetable bug							
<i>Nysius</i> (wheat bug)							
<i>Porina</i> sp.							
Slugs							
Thrips – flower & onion							
Tomato fruitworm/Cotton bollworm moth	**						
Whitefringed weevil							
Wireworms							

* Pest biological names are listed in the Appendices of this document

** The pest exterminator *Echthromorpha intricatoria* is found in Canterbury but not *Netelia producta*, a key exterminator in other parts of Aotearoa New Zealand.

¹ These predators don't feed on nectar, but native plantings support them by providing habitats and alternative food sources. Predatory insects - includes beetles (e.g. carabid & rove), predatory mites and bugs (e.g. damsel, pirate & soldier bugs).

3 Pasture species

Identify beneficial insects to manage insect pests on: clover, lucerne, pasture grasses

Forage crops are important for many Canterbury dairy, sheep and beef, and mixed farming systems to support livestock growth. White clover is also grown in Canterbury as a seed crop. Insect pest damage can reduce both feed quality and biomass, affecting grazing and harvest outcomes.

	BENEFICIAL INSECTS						
	Parasitoid wasps – ichneumonid	Parasitoid wasps – other	Bristle flies	Hover flies	Ladybird beetles	Lacewing – brown	Predatory insects ¹ , spiders & harvestmen
PESTS*	Australian crop mirid						
	Argentine stem weevil						
	Clover root weevil						
	Cosmopolitan/Northern armyworm						
	Grass grub						
	Greasy cutworm						
	Lucerne flea (Clover flea)						
	Lucerne weevil						
	Mealybugs						
	<i>Nysius</i> (wheat bug)						
	Pasture & clover aphids						
	<i>Porina</i> sp.						
	Red legged earth mite						
	Southern armyworm						
	Tropical armyworm						

* Pest biological names are listed in the Appendices of this document

¹ These predators don't feed on nectar, but native plantings support them by providing habitats and alternative food sources. Predatory insects - includes beetles (e.g. carabid & rove), predatory mites and bugs (e.g. damsel, pirate & soldier bugs).

4 Pipfruit

Identify beneficial insects to manage insect pests on: apple, pear

Pipfruit crops are grown on a smaller scale on the Canterbury Plains compared with northern Aotearoa New Zealand regions, but they remain locally important components of diversified farming and horticultural systems. Insect pests and diseases can reduce fruit quality, marketable yield, and tree health in pipfruit, affecting both fresh-market and processing returns.

		BENEFICIAL INSECTS						
		Parasitoid wasps – ichneumonid	Parasitoid wasps – other	Bristle flies	Hover flies	Ladybird beetles	Lacewing – brown	Predatory insects ¹ , spiders & harvestmen
PESTS*	Apple leafcurling midge							
	Bronze beetle							
	Codling moth							
	Froggatt's apple leafhopper							
	Leafrollers							
	Mites (e.g. brown, red & two spotted)							
	Oriental fruit moth							
	Pear and cherry slug							
	Pear leaf blister mite							
	Pear leaf-curling midge							
	Scale							
	Wooly apple aphid							

* Pest biological names are listed in the Appendices of this document

¹ These predators don't feed on nectar, but native plantings support them by providing habitats and alternative food sources. Predatory insects - includes beetles (e.g. carabid & rove), predatory mites and bugs (e.g. damsel, pirate & soldier bugs).

5 Berry fruits & grapes

Identify beneficial insects to manage insect pests on: blueberry, currants, grape, *Rubus* (raspberry, blackberry), strawberry

Berry crops in Canterbury are grown on a relatively small scale within diversified horticultural systems, contributing to high-value production. The region is Aotearoa New Zealand's main production area for blackcurrants, alongside smaller producers of raspberries, strawberries, blueberries and other *Rubus* crops, often supplying frozen or direct markets. While the climate is well suited to berry production, growth is constrained by labour availability, limited processing capacity, and a smaller domestic market in the South Island.

	BENEFICIAL INSECTS						
	Parasitoid wasps – ichneumonid	Parasitoid wasps – other	Bristle flies	Hover flies	Ladybird beetles	Lacewing – brown	Predatory insects ¹ , spiders & harvestmen
Australian crop mirid							
Berry aphids							
Black vine weevil							
Current clearwing moth							
Cyclamen mite							
Grape phylloxera							
Grass grub							
Greenhouse whitefly							
Green vegetable bug							
Leafrollers							
Mealybugs							
Mites (e.g. brown, red and two spotted)							
New Zealand raspberry bud moth							
<i>Nysius</i> (wheat bug)							
Passionvine hopper							
Potato mirid							
Scale							
Slugs							
Thrips – flower & onion							

* Pest biological names are listed in the Appendices of this document

¹ These predators don't feed on nectar, but native plantings support them by providing habitats and alternative food sources. Predatory insects - includes beetles (e.g. carabid & rove), predatory mites and bugs (e.g. damsel, pirate & soldier bugs).

6 Solanaceae

Identify beneficial insects to manage insect pests on: potato, tomato

The Canterbury region is a major producer for both fresh potatoes and seed potatoes in Aotearoa New Zealand. Tomatoes are grown in Canterbury primarily within indoor production systems. Insect pests can cause considerable damage in both production systems. Although opportunities to incorporate habitats for beneficial insects are limited in closed production environments, home gardeners often grow tomatoes, where native habitats provide opportunity to support pollinators and natural enemies.

		BENEFICIAL INSECTS						
		Parasitoid wasps – ichneumonid	Parasitoid wasps – other	Bristle flies	Hover flies	Ladybird beetles	Lacewing – brown	Predatory insects ¹ , spiders & harvestmen
PESTS*	Green looper							
	Green potato bug							
	Green vegetable bug							
	Greenhouse whitefly							
	Mealybugs							
	Potato mirid							
	Potato tuber moth							
	Solanaceae aphids							
	Thrips – flower & onion							
	Tomato fruitworm/Cotton bollworm moth	**						
	Tomato potato psyllid							
	Tomato stem borer							
Wireworms								

* Pest biological names are listed in the Appendices of this document

** The pest exterminator *Echthromorpha intricatoria* is found in Canterbury but not *Netelia producta*, a key exterminator in other parts of Aotearoa New Zealand.

[†] These predators don't feed on nectar, but native plantings support them by providing habitats and alternative food sources. Predatory insects - includes beetles (e.g. carabid & rove), predatory mites and bugs (e.g. damsel, pirate & soldier bugs).

7 Vegetable crops

Identify beneficial insects to manage insect pests on: bean, carrot, lettuce, onion, pea, squash.

Note: other vegetables such as broccoli, cauliflower, radish and corn are covered in the previous Brassica and Cereal tables

Vegetable production in Canterbury includes a diverse range of crops for both fresh consumption and seed. Beneficial insects can support integrated pest management by helping reduce pest damage, contamination and disease transmission.

		BENEFICIAL INSECTS						
		Parasitoid wasps – ichneumonid	Parasitoid wasps – other	Bristle flies	Hover flies	Ladybird beetles	Lacewing – brown	Predatory insects ¹ , spiders & harvestmen
PESTS*	Australian crop mirid							
	Carrot rust fly							
	Grass grub							
	Greasy cutworm							
	Green looper							
	Green vegetable bug							
	Lucerne flea							
	<i>Nysius</i> (wheat bug)							
	Potato mirid							
	Seedcorn maggot							
	Slugs							
	Soybean looper							
	Thrips – flower & onion							
	Tomato fruitworm/Cotton bollworm moth	**						
	Vegetable aphids							
	Wireworms							

* Pest biological names are listed in the Appendices of this document

** The pest exterminator *Echthromorpha intricatoria* is found in Canterbury but not *Netelia producta*, a key exterminator in other parts of Aotearoa New Zealand.

¹ These predators don't feed on nectar, but native plantings support them by providing habitats and alternative food sources. Predatory insects - includes beetles (e.g. carabid & rove), predatory mites and bugs (e.g. damsel, pirate & soldier bugs).

SECTION 2 – **Pollinating crops with beneficial insects**

Many crops rely on insects to transfer pollen between flowers, allowing fruit, seed, or vegetable crops to develop properly. These insects, known as pollinators, play a critical role in agricultural production by improving both crop yield and quality.

In Canterbury, a wide range of beneficial insects contribute to crop pollination. While managed honey bees are important pollinators, many wild insects — including native bees, bumble bees, flies, butterflies, and beetles — also visit crop flowers and can provide valuable pollination services.

Encouraging pollinators on farms can support more reliable crop production while also strengthening on-farm biodiversity. Flowering native plants, that provide food, shelter, and reduced insecticide exposure can all help maintain healthy pollinator populations.



Crop specific guide to pollination via beneficial insects

This section consists of seven sections as below:

1 Brassicas	Brassicas (oilseed rape, broccoli, cauliflower, cabbage, kale, mustard seed, pak choi, turnip)
2 Radish*	Radish
3 Pasture grasses	White clover, red clover, lucerne
4 Pipfruit	Apple, pear
5 Berry fruits	Blueberry, currants, <i>Rubus</i> (raspberry, blackberry), strawberry
6 Solanaceae	Tomato
7 Vegetable crops	Carrot, onion, squash

NB: This list covers crops pollinated by insects only. Crops pollinated by wind are excluded.

*Radish is separated here from other brassicas as their flowers attract fewer pollinator species.

- Find the crop table that applies to you.
- Beneficial insects are shown across the top of the table; green boxes indicate which insects are known to pollinate each crop.
- The beneficial insect factsheets in Section 4, page 41, provide more information about each insect, including photographs and notes on which crops they are most effective at pollinating.

All main Canterbury crops

The table below brings together a range of insects known to pollinate different crops. While there is a good amount of information available, it may not cover everything. Pollination can vary between farms, seasons, and management, and some insects may still contribute even if they haven't been recorded yet. So, if a pollinator isn't listed for a crop, it doesn't mean it isn't helping—it may just be unknown at this stage.

		BENEFICIAL INSECTS																	
		Honey bee	Bumble bees		Sweat bee	<i>Leioproctus</i> bees (black & orange)	Masked bees	Blow flies	Pollenia flies	Bristle flies	Striped flesh fly	Muscid flies	Drone fly	Hover flies				Green soldier fly	March fly
			Buff-tailed	Other										NZ blue	NZ black	NZ orange	Streaktail Globetail other		
CROP	1 Brassicas																		
	Brassicas																		
	2 Radish																		
	Radish																		
	3 Pasture species																		
	White clover																		
	Red clover																		
	Lucerne																		
	4 Pipfruit																		
	Apple																		
Pear																			

BENEFICIAL INSECTS

	Honey bee	Bumble bees		Sweat bee	<i>Leioproctus</i> bees (black & orange)	Masked bees	Blow flies	Pollenia flies	Bristle flies	Striped flesh fly	Muscid flies	Drone fly	Hover flies				Green soldier fly	March fly
		Buff-tailed	Other										NZ blue	NZ black	NZ orange	Streaktail Globetail other		
5 Berries																		
Blueberry																		
Currants																		
Raspberry																		
Strawberry																		
6 Solanaceae																		
Tomato*																		
7 Vegetable crops																		
Carrot																		
Onion																		
Squash																		

*Commercial tomatoes are grown in covered cropping systems in Canterbury and insect pollination in these systems relies on managed bumble bees to improve yields.

SECTION 3 – **Selecting native plants to attract beneficial insects**

For ease of navigation throughout the guide, plant names have been ordered alphabetically using their common name.

A more detailed table listing all the native plants from within this document, by their common, Māori and botanical names is included on page 139. This list has been ordered alphabetically by the genus of each plant. Making it easier for those familiar with botanical classifications to locate plants of the same genus if they need to.



Selecting native plants to suit your site requirements and needs

This section consists of seven sections as below:

1 Native plants to attract pest-exterminating insects	This table lists the native plants and the pest exterminators each plant supports
2 Native plants to attract pollinating insects	This table lists the native plants and the pollinators they support
3 Selecting native plants to suit your site	This table gives a brief overview of some key plant attributes such as height, growth rate, suitability to dry/wet sites that will help with the selection of plants suited to the specific conditions of your site, or areas of your site
4 Flowering seasons for native plants	This table outlines the peak flowering times of the native plants listed in this guide – to support plant selection that ensures the presence of beneficial insects at the times they are needed most

- Find the section that applies to you, such as pollinators or pest-controlling insects. Use the beneficial insects you identified in the crop tables to find which native plants support those insects.
- Aim to support a range of beneficial insects, not just one or two key species. This helps build resilience, so if one insect group is affected by weather or other pressures, others can continue supporting pollination or pest control.
- Use the native plant attribute tables to check which plants are suited to your site, and the flowering season table to select a mix of plants that flowers across the season.
- Some native plants can be toxic to livestock if browsed, or if seed, fruit or fallen material is eaten. In Canterbury, take particular care with tutu, kōwhai, poroporo and naturally occurring bracken. Ngaio, karaka, ongaonga and tītoki may also be relevant in some coastal or Banks Peninsula settings. Avoid planting known toxic species within grazing reach, fence plantings from stock, and seek local nursery, regional council or veterinary advice if unsure.
- Refer to the beneficial insect factsheets: Section 4, page 41, and the plant factsheets: Section 5, page 58, for more detailed information.

1 Planting natives to attract pest exterminating beneficial insects

Different native plants support different beneficial insects. The table below shows how native plants are linked to beneficial insects that exterminate pest insects. For some groups, such as bristle flies, hover flies, and ladybird beetles, we have included more detail to highlight the diversity within each. The insect pages in Section 4 (page 41) highlight some of the key members of these groups and their roles. Supporting a wide range of these natural enemies helps make pest control more reliable and resilient. Some predatory insects (see Section 1 (page 15)) don't feed on nectar and aren't tied to specific plants. However, they can still be encouraged by establishing diverse native plantings, which provide alternative prey and habitats, such as leaf litter, needed to complete their life-cycles.

	PEST EXTERMINATING INSECTS											
	Parasitoid wasps		Bristle flies			Hover flies				Ladybird beetles		Lacewings
	Ichneuomonid	Other	Ginger blister	Australian leaf roller	Blue, green, grey-black & other	NZ black	NZ orange	Streaktail	Globetail	11 spotted	2 spotted	Brown
Banks Peninsula hebe												
Cabbage tree												
Canterbury Plains tree daisy												
Cottonwood												
Creeping pōhuehue												
Five finger												
Flax												
Golden akeake												
Kānuka												
Lemonwood												
Lowland ribbonwood												
Mānuka												

PEST EXTERMINATING INSECTS

	PEST EXTERMINATING INSECTS											
	Parasitoid wasps		Bristle flies			Hover flies				Ladybird beetles		Lacewings
	Ichneuomonid	Other	Ginger blister	Australian leaf roller	Blue, green, grey-black & other	NZ black	NZ orange	Streaktail	Globetail	11 spotted	2 spotted	Brown
Marbleleaf												
Matagouri												
Mountain akeake												
Mountain flax												
Narrow-leaf pomaderris												
Narrow-leafed lacebark												
NZ Broadleaf												
NZ Broom												
NZ Myrtle												
Shrubby tororaro												
<i>Teucrium parvifolium</i>												
Weeping kōwhai [†]												
Willow-leaf hebe												
Wire vine												
Wire-netting bush												

[†]WARNING - can be toxic to grazing animals.

2 Planting natives to attract pollinating insects

This section visualises how pollinators and native plants are connected. For display purposes the tables are broken up into three groups, bees, bristle flies and predatory hover flies, and other flower pollinating flies.

Bees: Bees are among the most effective pollinators in productive landscapes. Native plants provide essential food, nectar and pollen, for both native and introduced bees. Supporting a diverse range of bee species can improve crop pollination and resilience, as different bees vary in their size, behaviour, and seasonal activity.

POLLINATING INSECTS – BEES

		Honey bee	Bumble bees		<i>Leioproctus</i> bees		Sweat bee	Masked bees
			Buff-tailed	Other	Black	Orange		
NATIVE PLANT	Banks Peninsula hebe							
	Cabbage tree							
	Canterbury Plains tree daisy							
	Cottonwood							
	Creeping pōhuehue							
	Five finger							
	Flax							
	Golden akeake							
	Kānuka							
	Lemonwood							
	Lowland ribbonwood							
	Mānuka							

POLLINATING INSECTS – BEES

		Honey bee	Bumble bees		<i>Leioproctus</i> bees		Sweat bee	Masked bees
			Buff-tailed	Other	Black	Orange		
NATIVE PLANT	Marbleleaf							
	Matagouri							
	Mountain akeake							
	Mountain flax							
	Narrow-leaf pomaderris							
	Narrow-leafed lacebark							
	NZ Broadleaf							
	NZ Broom							
	NZ Myrtle							
	Shrubby tororaro							
	<i>Teucrium parvifolium</i>							
	Weeping kōwhai†							
	Willow-leaf hebe							
	Wire vine							
	Wire-netting bush							

†WARNING - can be toxic to grazing animals.

2 Planting natives to attract pollinating insects (continued)

Bristle flies and predatory hover flies: The table below highlights the relationships between bristle flies and predatory hover flies, and native plants. Although often overlooked, these flies can be abundant in agricultural landscapes and provide dual services on farms: as larvae they act as pest exterminators, while as adults they feed on nectar and pollen and contribute to crop pollination.

POLLINATING INSECTS – BRISTLE FLIES AND PREDATORY HOVER FLIES										
NATIVE PLANT	Bristle flies						Hover flies			
	Ginger blister	Australian leaf roller	Blue	Green	Grey-black	Other	NZ black	NZ orange	Streaktail	Globetail
	Banks Peninsula hebe									
	Cabbage tree									
	Canterbury Plains tree daisy									
	Cottonwood									
	Creeping pōhuehue									
	Five finger									
	Flax									
	Golden akeake									
Kānuka										
Lemonwood										
Lowland ribbonwood										
Mānuka										

POLLINATING INSECTS – BRISTLE FLIES AND PREDATORY HOVER FLIES

	Bristle flies						Hover flies			
	Ginger blister	Australian leaf roller	Blue	Green	Grey-black	Other	NZ black	NZ orange	Streaktail	Globetail
Marbleleaf										
Matagouri										
Mountain akeake										
Mountain flax										
Narrow-leaf pomaderris										
Narrow-leafed lacebark										
NZ Broadleaf										
NZ Broom										
NZ Myrtle										
Shrubby tororaro										
<i>Teucrium parvifolium</i>										
Weeping kōwhai†										
Willow-leaf hebe										
Wire vine										
Wire-netting bush										

†WARNING - can be toxic to grazing animals.

2 Planting natives to attract pollinating insects (continued)

Other flower visiting flies: The table below shows the relationship between other flower visiting flies, including non-predatory hover flies and blow flies, and native plants. Native plants provide important nectar and pollen resources for these insects, many of which contribute to pollination in productive landscapes. Supporting a diverse mix of pollinating insects helps make pollination more reliable; for example, many fly species remain active during cooler or cloudier conditions when bee activity is lower.

POLLINATING INSECTS – OTHER FLOWER VISITING FLIES

NATIVE PLANT		Drone fly	Hover flies		Blow flies			Pollenia flies		Muscid flies		Striped flesh fly	Green soldier fly	March fly
			NZ blue	Other	Brown	European blue	Other	Bronze cluster	Other	Blue	Other			
	Banks Peninsula hebe													
	Cabbage tree													
	Canterbury Plains tree daisy													
	Cottonwood													
	Creeping pōhuehue													
	Five finger													
	Flax													
	Golden akeake													
Kānuka														
Lemonwood														
Lowland ribbonwood														
Mānuka														

POLLINATING INSECTS – OTHER FLOWER VISITING FLIES

		Drone fly	Hover flies		Blow flies			Pollenia flies		Muscid flies		Striped flesh fly	Green soldier fly	March fly
			NZ blue	Other	Brown	European blue	Other	Bronze cluster	Other	Blue	Other			
NATIVE PLANT	Marbleleaf													
	Matagouri													
	Mountain akeake													
	Mountain flax													
	Narrow-leaf pomaderris													
	Narrow-leafed lacebark													
	NZ Broadleaf													
	NZ Broom													
	NZ Myrtle													
	Shrubby tororaro													
	<i>Teucrium parvifolium</i>													
	Weeping kōwhai†													
	Willow-leaf hebe													
	Wire vine													
	Wire-netting bush													

†WARNING - can be toxic to grazing animals.

3 Selecting natives to suit your site

From the list of suggested natives you have created, check which have the characteristics to suit your specific site. This table provides a brief overview of some key characteristics of the plantings. Consult an expert in native plants and planting to refine your selections so they suit your site conditions, climate, space limitations, budget, and maintenance preferences before making any investment.

Key:

small shrub (<5 m) | large shrub (5–10 m) | small tree (<10 m) |
medium tree (10–20 m) | under pivot (<2.5 m)

PLANT CHARACTERISTICS

NATIVE PLANT		Structure	Growth rate	Height at 5 years	Height mature	Width mature	Flowering (months)	Wet sites	Moist sites	Dry sites	Full sun	Partial shade	Full shade	Frost tolerant	Under pivot
	Banks Peninsula hebe	small shrub	medium	1.5 m	2 m	2 m	Dec	N	Y	Y	Y	Y	N	hardy	Y
	Cabbage tree	medium tree	medium/rapid	4 m	10 m	2 m	Nov	Y	Y	Y	Y	Y	Y	hardy	N
	Canterbury Plains tree daisy	small shrub	medium	0.8 m	1.5 m	1.5 m	Jan, Feb	N	N	Y	Y	N	N	hardy	Y
	Cottonwood	small shrub	medium	2 m	2 m	2 m	Dec, Jan, Feb	N	Y	Y	Y	Y	N	hardy	Y
	Creeping pōhuehue	ground-cover	medium	0.2 m	0.2 m	1 m	Nov, Dec, Mar, Apr	N	Y	Y	Y	Y	N	hardy	Y
	Five finger	small tree	medium	3 m	6 m	3.5 m	Jun, Jul, Aug	N	Y	N	Y	Y	Y	hardy	N
	Flax	small shrub	rapid	2 m	3 m	2 m	Oct, Nov	Y	Y	Y	Y	Y	N	hardy	N
	Golden akeake	small tree	rapid	3 m	4 m	2.5 m	Apr, May	N	Y	Y	Y	Y	N	hardy	N
	Kānuka	small tree	medium	3 m	8 m	3 m	Nov, Dec	N	Y	Y	Y	Y	N	moderately	N
	Lemonwood	medium tree	rapid	3 m	12 m	3 m	Sept, Oct	N	Y	N	Y	Y	Y	avoid when young	N
	Lowland ribbonwood	medium tree	medium/rapid	4 m	12 m	4 m	Oct, Nov	Y	Y	Y	Y	Y	N	hardy	N
	Mānuka	small tree	medium/rapid	2 m	4 m	3 m	Nov, Dec	N	Y	Y	Y	Y	N	avoid heavy frosts	N

PLANT CHARACTERISTICS

NATIVE PLANT		Structure	Growth rate	Height at 5 years	Height mature	Width mature	Flowering (months)	Wet sites	Moist sites	Dry sites	Full sun	Partial shade	Full shade	Frost tolerant	Under pivot
	Marbleleaf	medium tree	medium	6 m	10 m	4 m	Nov, Dec	Y	Y	N	Y	Y	N	avoid when young	N
	Matagouri	divaricating shrub	slow	1.5 m	5 m	3 m	Oct, Nov	N	N	Y	Y	N	N	hardy	N
	Mountain akeake	small shrub	medium	2 m	4 m	3 m	Mar, Apr, May	N	Y	Y	Y	Y	N	hardy	N
	Mountain flax	small shrub	rapid	1.5 m	1.5 m	1.5 m	Nov, Dec	N	Y	Y	Y	Y	N	hardy	Y
	Narrow-leaf pomaderris	small shrub	medium	0.5 m	1.5 m	2 m	Nov	N	N	Y	Y	Y	N	hardy	Y
	Narrow-leafed lacebark	small tree	medium	3 m	6 m	3 m	Dec, Jan	N	Y	Y	Y	Y	N	hardy	N
	NZ Broadleaf	large shrub	medium	3 m	6 m	2.5 m	Sep, Oct, Nov	N	Y	Y	Y	Y	N	hardy	N
	NZ Broom	small shrub	medium	2 m	3 m	2 m	Nov, Dec	N	Y	Y	Y	N	N	hardy	N
	NZ Myrtle	small shrub	medium	1 m	2 m	2 m	Nov, Dec	N	Y	Y	Y	Y	N	hardy	Y
	Shrubby tororaro	divaricating shrub	medium	1 m	2 m	1.5 m	Feb, Mar, Apr	N	Y	Y	Y	Y	N	hardy	Y
	<i>Teucrium parvifolium</i>	small shrub	rapid	2 m	2 m	1 m	Oct, Nov, Dec, Jan	N	Y	Y	Y	Y	N	hardy	Y
	Weeping kōwhai [†]	small tree	medium	3 m	8 m	3 m	Sept, Oct	N	Y	Y	Y	Y	Y	hardy	N
	Willow-leaf hebe	small shrub	rapid	3 m	4 m	2 m	Jan, Feb	N	Y	Y	Y	Y	N	hardy	N
	Wire vine	vine	medium	1 m	2 m	3 m	Dec, Jan, Feb	N	Y	Y	Y	Y	Y	hardy	Y
	Wire-netting bush	divaricating shrub	medium	2 m	3 m	2 m	Sep, Oct, Nov	N	Y	Y	Y	Y	N	hardy	N

[†] WARNING - can be toxic to grazing animals.

4 Selecting plants with overlapping flowering seasons

To attract and support beneficial insects, it's best to plant a diverse range of native species. Flowering plants provide essential food, and choosing a mix that flowers at different times helps ensure a continuous supply across the seasons. This creates a more stable habitat and food source throughout their life-cycles, although flowering is naturally limited during colder months.

Considering the flowering season of the natives you wish to plant enables you to support your target beneficial insects at the time your crop needs them most.

	FLOWERING SEASON											
	Spring			Summer			Autumn			Winter		
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Lemonwood												
Weeping kōwhai [†]												
NZ broadleaf												
Wire-netting bush												
Flax												
Lowland ribbonwood												
Matagouri												
<i>Teucrium parvifolium</i>												
Cabbage tree												
Narrow-leaf pomaderris												
Kānuka												
Mānuka												
Mountain flax												
NZ broom												
NZ myrtle												
Creeping pōhuehue												
Marbleleaf												
Banks Peninsula hebe												
Narrow-leafed lacebark												
Cottonwood												
Wire vine												
Canterbury Plains tree daisy												
Willow-leaf hebe												
Shrubby tororaro												
Mountain akeake												
Golden akeake												
Five finger												

[†]WARNING - can be toxic to grazing animals.



SECTION 4 –
Beneficial Insects
factsheets

What are beneficial insects?

Beneficial insects benefit farmers economically and environmentally. Two particularly important types are the pollinators and pest exterminators.



Pollinators such as bees and flies improve crop yields and quality by helping plants set fruit and seed.



"Pest exterminators" help control crop pests naturally, they do this via two modes:

Predators: are generalist hunters that eat many pests and are most effective when pest numbers are high. Examples: ladybirds, lacewings and spiders

Parasitoids: act more like precision weapons, targeting specific pests by laying their eggs on, near or inside their prey, even when pest populations are still low. As the young develop they eventually kill their host. Examples: specialised, often tiny, wasps and bristle flies.

Supporting all these beneficial insects by planting flowering natives strengthens on farm biological control, reduces reliance on pesticides, and improves overall farm resilience.

There are many helpful beneficial species to promote on farms like carabid beetles and soldier bugs that control pests, and bumble bees and drone flies that play a key role in pollination.

In this guide, we highlight seven beneficial insects that are especially worth getting to know. These are some of the real unsung heroes, species that either do both jobs (pest control and pollination) or are particularly effective at what they do on Canterbury farms.

1	Hover flies	Pest exterminator (Predator) & Pollinator
2	Lacewings	Pest exterminator (Predator)
3	Bristle flies	Pest exterminator (Parasitoid) & Pollinator
4	Ladybird beetles	Pest exterminator (Predator)
5	Parasitoid wasps	Pest exterminator (Parasitoid)
6	<i>Leioproctus</i> bees	Pollinator
7	Sweat bees	Pollinator

Each of these beneficial insects are profiled in a two-page factsheet over the following pages. Each factsheet contains detailed information about the insect, alongside charts to indicate compatibility between the insect and common species of native plants, as well as a measure of their pollination efficacy on key crops, and pest exterminating ability.

Understanding each beneficial insect factsheet

Name	Common name, (<i>biological name</i>).
Beneficial attribute(s)	 Pollinating insect  Pest exterminator
Summary description	A short written summary of the characteristics and behaviours of the named insect.
Photos	High resolution photos to support positive identification of the named insect at various stages of its life-cycle.
Life-cycle diagram	Depicts the stages and duration of an insect's life-cycle. Side notes indicate where each life stage can be found on a plant, helping with accurate identification during scouting or observation. Icons shown on the diagram indicate the mode of action exercised whether pollinator or pest exterminator at the different stages of the life-cycle.
Actual size	A metric scale and image are provided to demonstrate the actual size of the beneficial insect at each stage of its life-cycle, to help with positive identification of the insect during scouting/observation.
Pest species targeted	Thirteen key pests from the Canterbury region are highlighted. When a green square is present the insect is a verified exterminator for that pest.  = verified exterminator For specific information on all pest targets refer to the tables in Section 1 (page 15).

Attraction to native plant

The number of green boxes alongside each of the native plants listed, indicates how likely you are to see the insect visiting this plant as a habitat and/or food source.

-  = **moderate** appeal
[>1 individuals/plant recorded at >20% of research sites]
-  = **good** appeal
[>5 individuals/plant recorded at >20% of research sites]
-  = **strong** appeal
[>8 individuals/plant recorded at >40% of research sites]
-  = **outstanding** appeal
[>10 individuals/plant across >80% of research sites]
-  = **exceptional** appeal
[>20 individuals per plant across >90% of research sites]

Crops pollinated

Crops listed are main crops cultivated in Canterbury. The number of green boxes alongside each crop, indicates how effective the named insect is at pollinating that crop.

-  = **assumed*** (not verified)
-  = **good** (verified)
-  = **excellent** (verified)

* 'assumed' - the insect has been observed on the crop, but pollination efficacy data has not been collected. In these cases, pollinating ability has been assumed, though actual efficacy is unknown.

A blank square indicates that the insect has not been observed on the crop, and pollination efficiency is unknown

1 Hover flies



There are around 90 hover fly species in Aotearoa New Zealand⁽¹⁰⁾, and several have larvae that feed on small, soft-bodied pests such as aphids and other insects⁽¹¹⁾. Common examples include the New Zealand black hover fly (*Melangyna novaezelandiae*), streaktail hover flies (*Allograpta* spp.), and globetail hover flies (*Sphaerophoria macrogaster*).

One of the best known pest exterminating species is the **New Zealand orange hover fly** (*Melanostoma fasciatum*), also known as the "small hover fly" (referred to here as "hover fly – NZ orange"). This species is widespread⁽¹²⁾ and, as an adult, pollinates a wide range of crops including carrot, onion and brassicas⁽⁸⁾, and can remain active under cool, cloudy conditions⁽¹³⁾. Its larvae (maggots) are effective predators of soft-bodied pests such as aphids and small caterpillars⁽¹⁴⁾. Both male and female adults feed on nectar and pollen from a wide range of plant species⁽¹⁴⁾. Under laboratory conditions, larvae have been observed to consume more than 12 tomato potato psyllid nymphs per day⁽¹⁵⁾.



Eggs



Larva



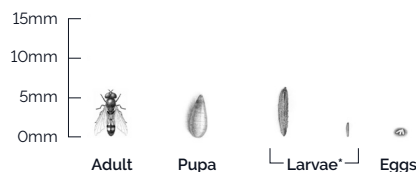
Adult

Life-cycle (Hover fly – NZ orange)

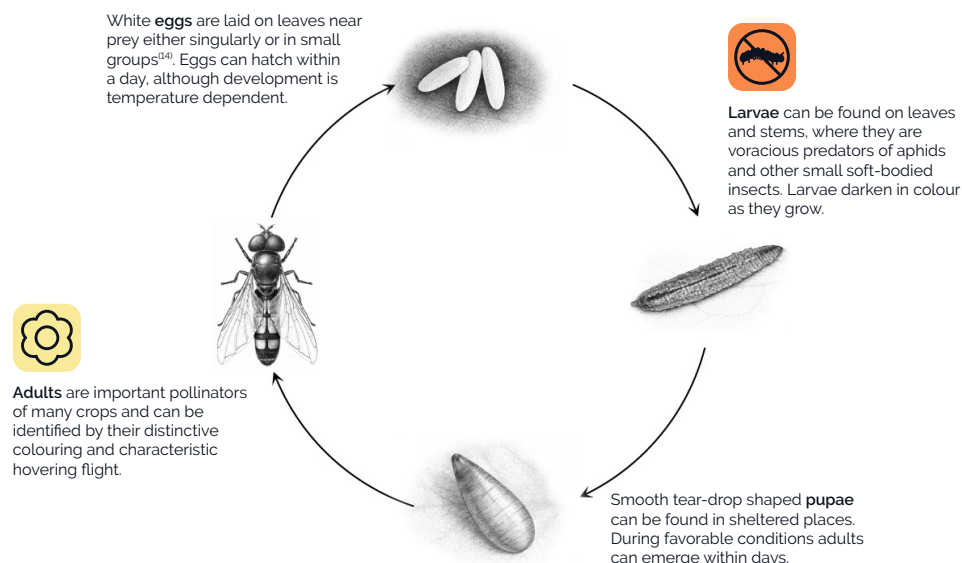
Hover flies have a simple life-cycle: egg > larva > pupa > adult.

Larvae and adults occur in spring, summer, and autumn, with temperature-dependent development allowing multiple generations per year⁽¹⁴⁾.

Actual size (Hover fly – NZ orange)



*Larvae can range from <2 to >5mm



Attraction to native plant (Hover fly – NZ orange)

NATIVE PLANT					
	moderate	good	strong	outstanding	exceptional
Banks Peninsula hebe/Kōkōmuka					
Cabbage tree/Ti kōuka					
Canterbury Plains tree daisy					
Cottonwood/Tauhinu					
Creeping pōhuehue/Pōhuehue					
Five finger/Whauwhaupaku					
Flax/Harakeke					
Golden akeake/Akiraho					
Kānuka					
Lemonwood/Tarata					
Lowland ribbonwood/Mānatu					
Mānuka					
Marbleleaf/Putaputawētā					
Matagouri/Tūmatakuru					
Mountain akeake					
Mountain flax/Wharariki					
Narrow-leaf Pomaderris/Tauhinu					
Narrow-leafed lacebark/Houhi					
NZ Broadleaf/Kāpuka					
NZ Broom/Mākaka					
NZ Myrtle/Rōhutu					
Shrubby tororaro/Tororaro					
<i>Teucrium parvifolium</i>					
Weeping kōwhai/Kōwhai					
Willow-leaf hebe/Koromiko					
Wire vine/Pōpōhue					
Wire-netting bush/Korokio					

Crops pollinated



CROP			
	assumed	verified good	verified excellent
Apple			
Blueberries			
Brassicas			
Carrot			
Lucerne			
Onion			
Pear			
Radish			
Squash			
Strawberries			
White clover			

Pest species targeted



PEST		
Aphids		
Codling moth		
Diamondback moth		
Grass grub		
Greasy cutworm		
Leafroller caterpillars		
Mealybug		
Porina		
Potato tuber moth		
Scale		
Tomato fruitworm		
Tomato-potato psyllid		
White butterfly		

2 Lacewings



Lacewings are natural pest exterminators that feed on aphids and other soft-bodied insects, helping reduce the need for insecticides.

In Aotearoa New Zealand there are around 15 species, with brown lacewings the most common in farmland⁽¹⁶⁾. The **brown lacewing** (*Micromus tasmaniae*) is widespread in crops, pasture and field margins⁽¹⁷⁾. Both larvae and adults are voracious predators and can respond quickly to rising aphid populations, often becoming more noticeable during pest outbreaks⁽¹⁷⁾. Adults hunt insects and feed on nectar⁽¹⁷⁾ and can be found on many native and exotic plant species.



Eggs



Larva



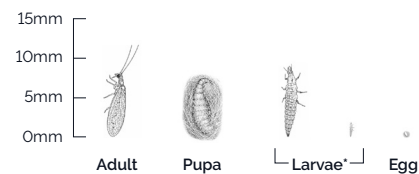
Adult

Life-cycle (Lacewing – brown)

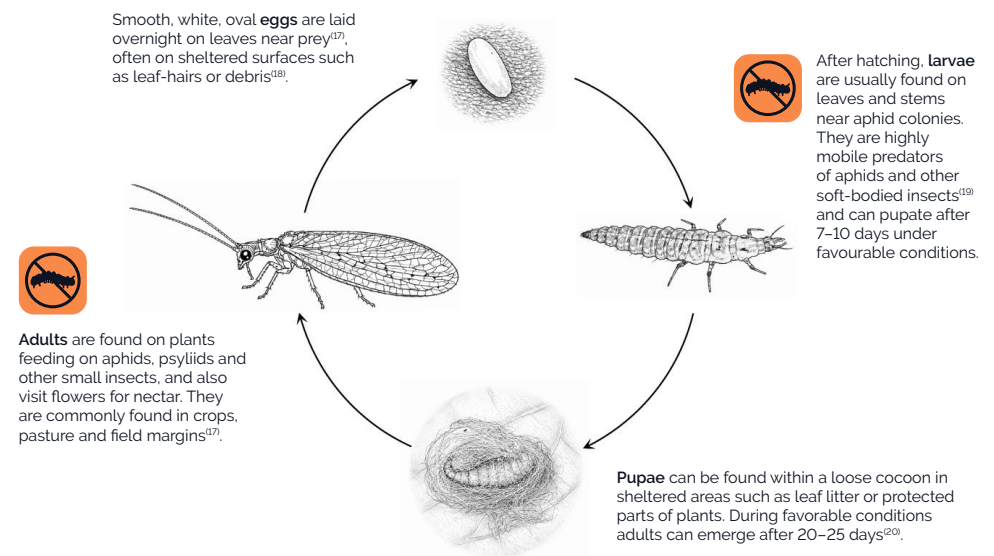
Lacewings have a simple life-cycle: egg > larva > pupa > adult.

In Canterbury, approximately 6–7 generations occur per year, with all life stages developing year-round at temperature-dependent rates.

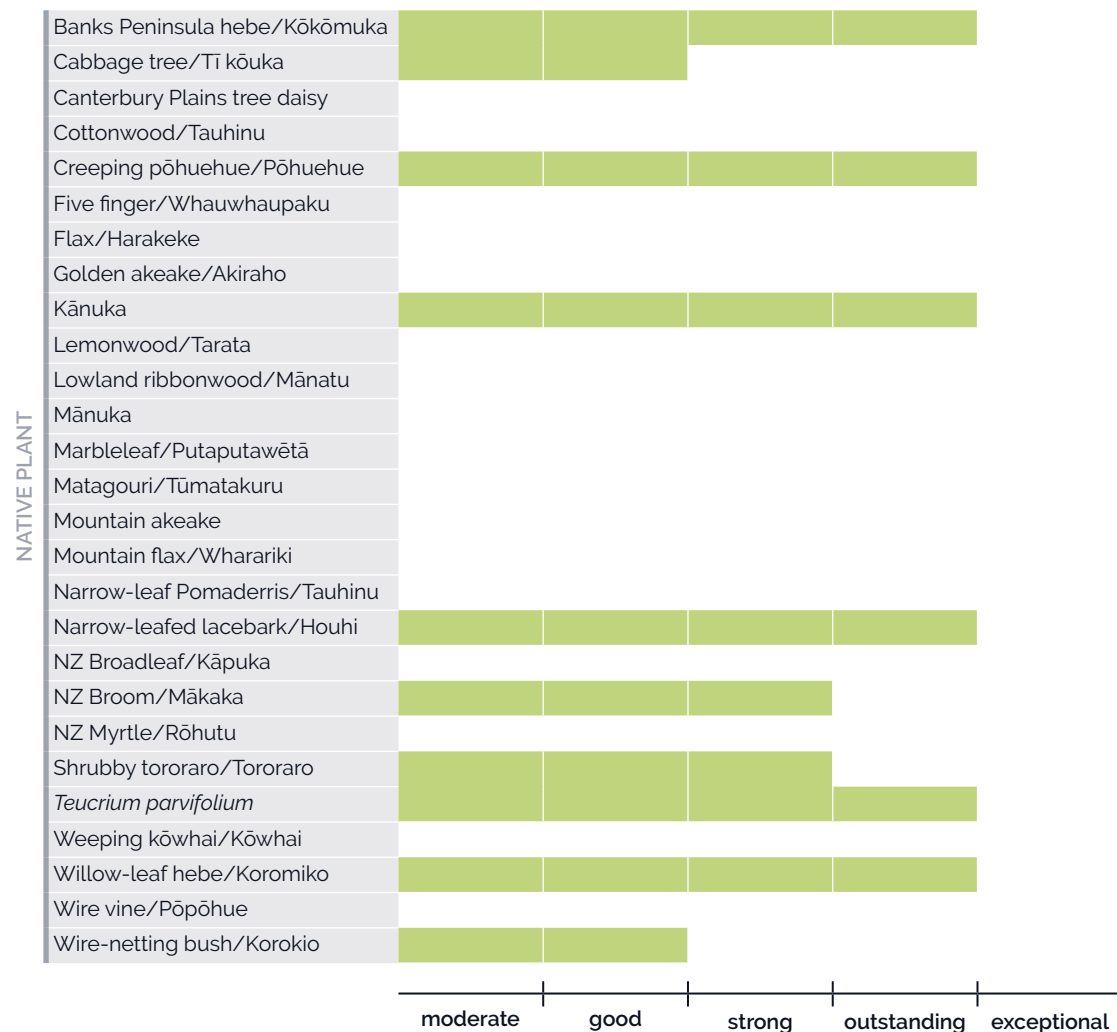
Actual size (Lacewing – brown)



*Larvae can range from <2 to 9mm



Attraction to native plant (Lacewing – brown)



Crops pollinated



CROP

Apple
Blueberries
Brassicas
Carrot
Lucerne
Onion
Pear
Radish
Squash
Strawberries
White clover



Pest species targeted



PEST

Aphids	moderate
Codling moth	
Diamondback moth	moderate
Grass grub	
Greasy cutworm	
Leafroller caterpillars	
Mealybug	moderate
Porina	
Potato tuber moth	
Scale	moderate
Tomato fruitworm	
Tomato-potato psyllid	moderate
White butterfly	moderate

3 Bristle flies



Bristle flies help farmers by attacking crop pests, helping to regulate populations of caterpillars and other insects and reducing the need for insecticides. Unlike predators, they are parasitoids, meaning their larvae develop inside a host insect and eventually kill it. Some species lay eggs directly on the host, while others deposit eggs or larvae nearby⁽²²⁾. This makes them effective at targeting pests that are otherwise hidden or difficult to reach. In Aotearoa New Zealand there are over 180 species, many of which are native⁽²¹⁾, and they play an important but often overlooked role in pasture and crop systems⁽²²⁾. Several bristle fly species attack important pasture and crop pests. Grey-black species such as *Pales usitata* attack porina⁽¹¹⁾, while *Proscissio cana* will target grass grub, in pasture with bushland shelter⁽²³⁾. Bluish species such as *Pales funesta* attack leafrollers⁽²⁴⁾, and *Pales marginata* targets tortricid and psychid moth caterpillars⁽¹¹⁾. The zebra-striped introduced Australian leafroller fly also attacks a wide range of pest leafroller species⁽²⁵⁾.

The **ginger blister fly** (*Protophycticia alcis*) is a valuable species that parasitises porina caterpillars⁽²⁶⁾. It is a large orange fly commonly seen in spring (October–November and summer) resting on tree trunks or flying low over pasture where porina are present⁽²⁶⁾.



Adult ginger blister fly visiting Kānuka flowers.

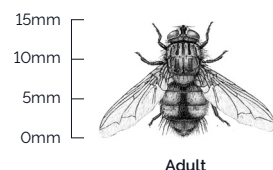


Life-cycle (Bristle fly – ginger blister)

Ginger blister flies have a simple life-cycle: egg > larva > pupa > adult.

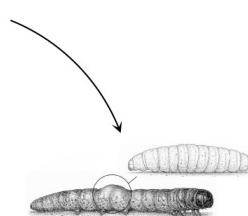
Females deposit live larvae rather than eggs, and these actively search for caterpillars, entering the host and developing inside⁽²⁶⁾. Detailed information on the timing of their life-cycle is limited.

Actual size (Bristle fly – ginger blister)

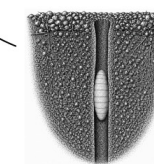


Adult

Flies lay live **larvae** near the tunnels of porina moth caterpillars⁽²²⁾. Porina moths live in burrows in the soil but come to the surface at night to feed, which is when they are most at risk to parasitism⁽²⁶⁾.



Larvae burrow into the caterpillar and develop inside. Parasitised caterpillars can be difficult to detect and usually appear normal.

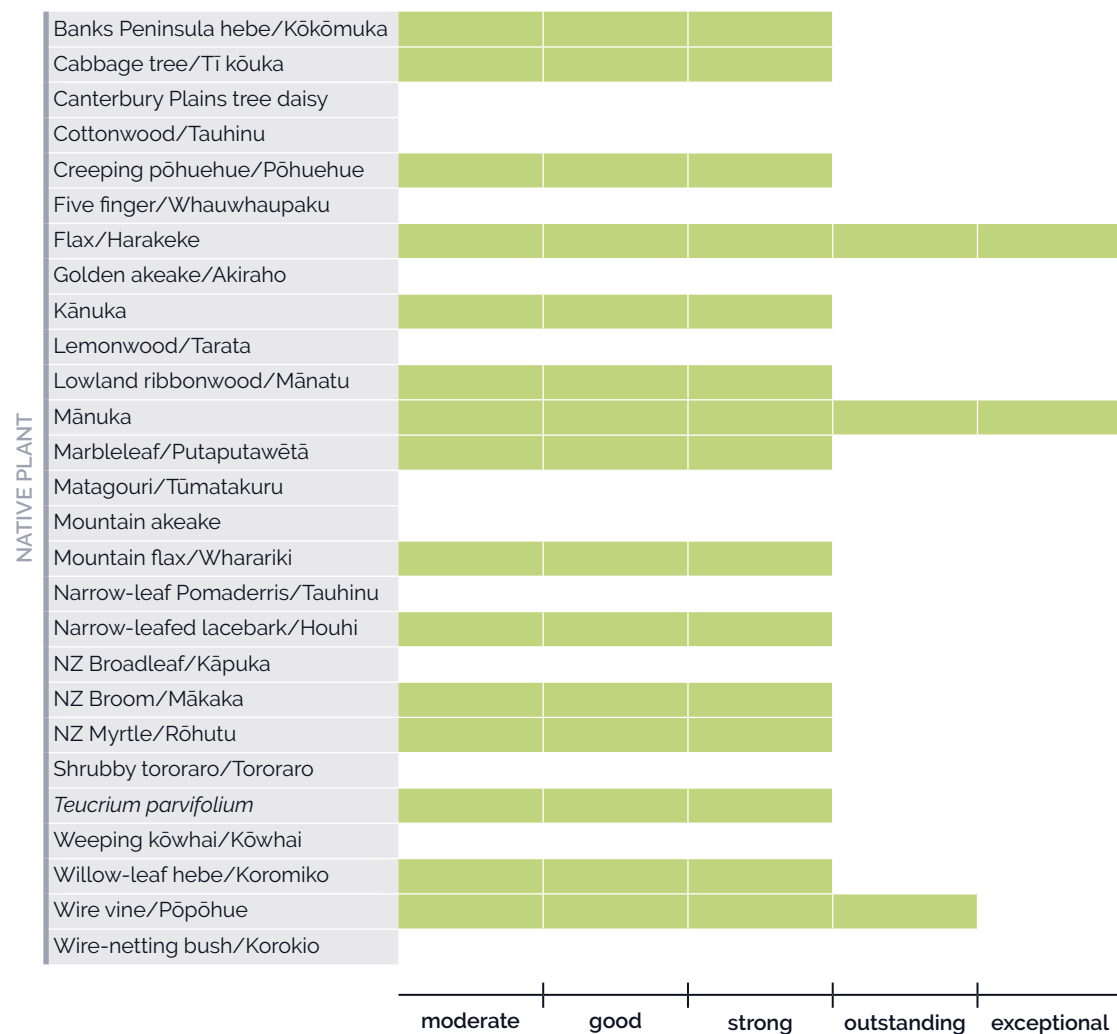


Fully grown larvae burrow out of the dead host caterpillar and **pupate** approximately 1.5 cm underground in a hardened case⁽²⁶⁾.

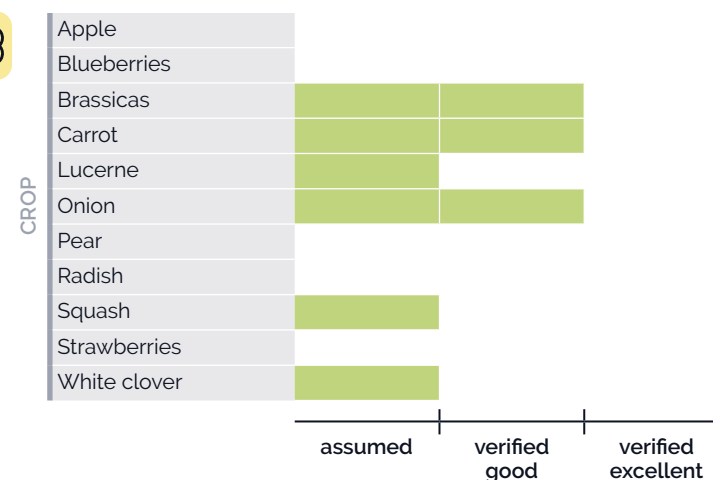


Adult flies feed on nectar from native plants and are excellent pollinators of brassica, onion and carrot crops⁽⁹⁾. In spring and summer they are seen resting on vegetation or tree trunks, or flying low over pasture while searching for hosts⁽²⁶⁾.

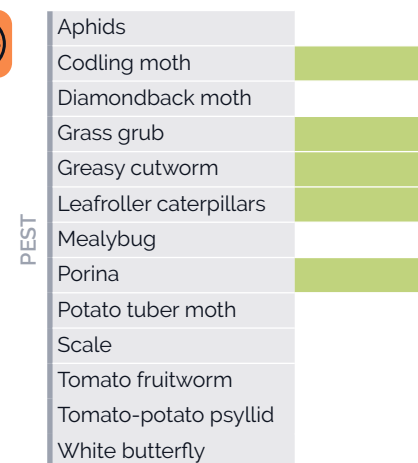
Attraction to native plant (Bristle flies – general)



Crops pollinated



Pest species targeted



4 Ladybird beetles



Ladybirds are natural pest controllers that eat aphids and other crop pests, helping reduce the need for insecticides. In Aotearoa New Zealand there are about 45 species (around 25 native, 19 introduced and 1 invasive), and while most are predators, a few feed on fungi or plants⁽²⁷⁾. Beetles may also feed on pollen⁽²⁸⁾.

On Canterbury farms, a very common species is the **eleven-spotted ladybird** (*Coccinella undecimpunctata*), found in grasslands, crops and field edges where aphids are abundant. Both adults and larvae are voracious predators and can survive tough conditions by switching between prey such as aphids, caterpillars, psyllids and lucerne flea, and occasionally feeding on the eggs and larvae of other beneficial insects, as well as cannibalising when prey is scarce⁽²⁹⁾.



Eggs



Larva



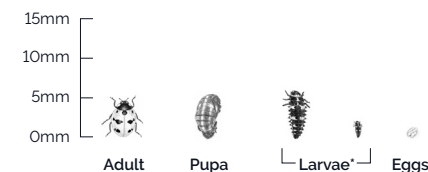
Adult

Life-cycle (Ladybird beetle – 11 spotted)

All ladybird beetles have a simple life-cycle: egg > larva > pupa > adult.

Development is temperature-dependent, with at least two generations per year, and aligns with peak aphid populations⁽²⁹⁾.

Actual size (Ladybird beetle – 11 spotted)

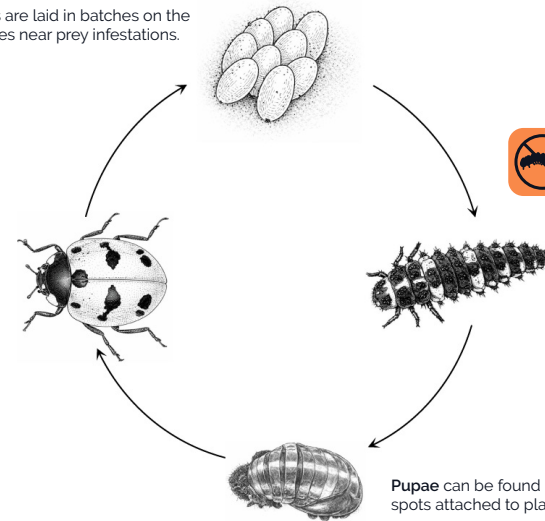


*Larvae can range from <2 to >5mm

Oval, yellow **eggs** are laid in batches on the underside of leaves near prey infestations.



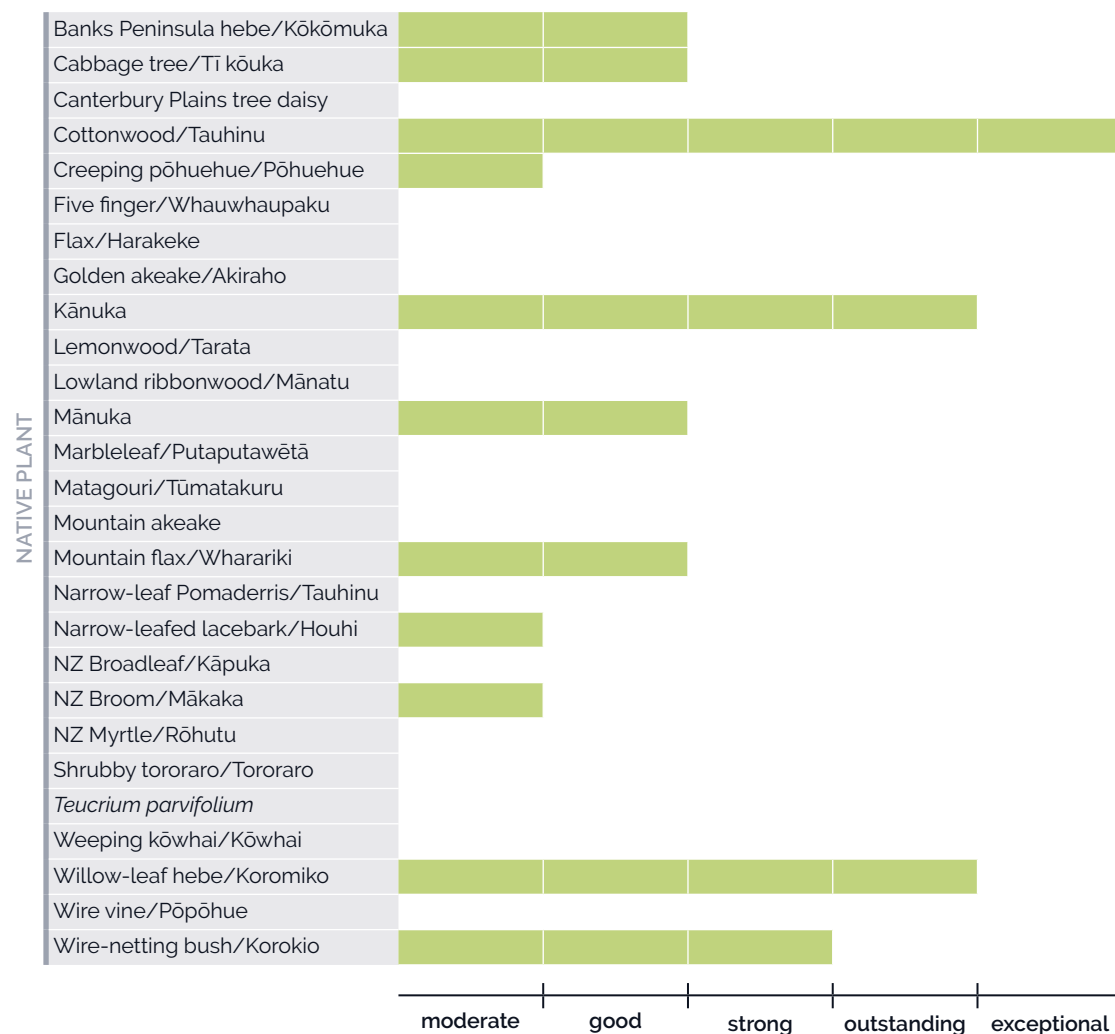
Adults are easily spotted on plants by their bright colours. In Canterbury, adults overwinter in sheltered sites, becoming active again in spring⁽³⁰⁾.



Larvae can be found on plants from September onwards. Both larvae and adults eat aphids and other soft-bodied insects. Larvae pass through four feeding stages before pupating.

Pupae can be found in sheltered spots attached to plants.

Attraction to native plant (Ladybird beetle – 11 spotted)



Crops pollinated



CROP

Apple
Blueberries
Brassicas
Carrot
Lucerne
Onion
Pear
Radish
Squash
Strawberries
White clover

assumed verified good verified excellent

Pest species targeted



PEST

Aphids
Codling moth
Diamondback moth
Grass grub
Greasy cutworm
Leafroller caterpillars
Mealybug
Porina
Potato tuber moth
Scale
Tomato fruitworm
Tomato-potato psyllid
White butterfly

5 Parasitoid wasps



Parasitoid wasps control pests by laying their eggs on or inside other insects, with the developing larvae feeding on and eventually killing the host. One group of parasitoid wasps, the **ichneumonid wasps**, are important pest exterminators, parasitising a wide range of crop pests, helping to regulate insect populations and reduce the need for insecticides. In Aotearoa New Zealand, there are just over 100 described species, but total diversity is likely closer to 500 species⁽³¹⁾. Most attack the larvae or pupae of insects such as moths, beetles, and flies. Adults typically feed on nectar, so flowering plants support their populations⁽³¹⁾.

On Canterbury farms, ichneumonid wasps are commonly associated with pasture, crop, and field-edge habitats where host insects are present, although they are often overlooked due to their small size and cryptic behaviour. A key example is *Diadegma semiclausum*, an introduced parasitoid that attacks the larvae of diamondback moth (*Plutella xylostella*), a major pest of brassica crops⁽³²⁾. This wasp lays its eggs inside the caterpillar, and the developing larva eventually

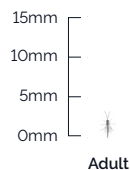
kills the host, helping to suppress pest populations⁽³²⁾. Like many ichneumonids, *D. semiclausum* is most effective where habitats provide both suitable hosts and access to floral resources like native plantings⁽³³⁾.

Life-cycle (*Diadegma semiclausum*)

Diadegma semiclausum like other parasitoid wasps have a simple life-cycle: egg > larva > pupa > adult.

Development is temperature-dependent, but can be as short as 18 days in summer. With multiple generations possible throughout summer. Parasitism rates of >70% have been recorded in diamondback moths⁽³⁵⁾.

Actual size (*Diadegma semiclausum*)



Diadegma semiclausum adult.

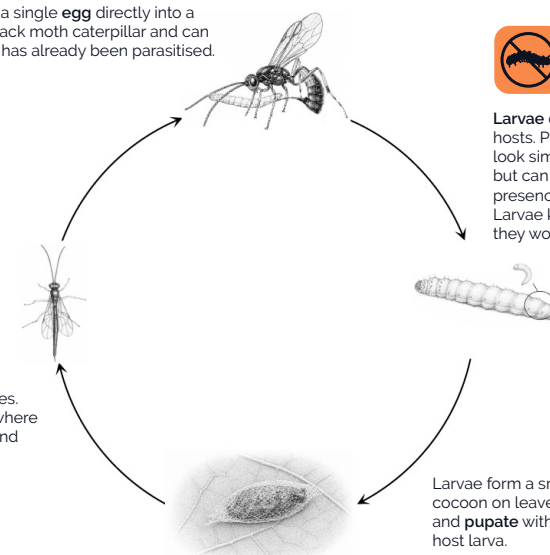


Diadegma semiclausum adult parasitising a diamondback moth larva.

Adults lay a single **egg** directly into a diamondback moth caterpillar and can detect if it has already been parasitised.



Larvae develop inside caterpillar hosts. Parasitised caterpillars look similar to healthy ones, but can be identified by the presence of white larvae inside. Larvae kill hosts around the time they would normally pupate.



Adults are small and difficult to identify, feeding on nectar from flowering plants, including natives. Populations are most effective where insecticide use is minimised⁽³⁵⁾ and floral resources are available⁽³⁴⁾.

Larvae form a small whitish fibrous cocoon on leaves near feeding damage, and **pupate** within this after killing the host larva.

Attraction to native plant (Parasitoid wasps – general)

NATIVE PLANT					
	moderate	good	strong	outstanding	exceptional
Banks Peninsula hebe/Kōkōmuka					
Cabbage tree/Ti kōuka					
Canterbury Plains tree daisy					
Cottonwood/Tauhinu					
Creeping pōhuehue/Pōhuehue					
Five finger/Whauwhaupaku					
Flax/Harakeke					
Golden akeake/Akiraho					
Kānuka					
Lemonwood/Tarata					
Lowland ribbonwood/Mānatu					
Mānuka					
Marbleleaf/Putaputawētā					
Matagouri/Tūmatakuru					
Mountain akeake					
Mountain flax/Wharariki					
Narrow-leaf Pomaderris/Tauhinu					
Narrow-leafed lacebark/Houhi					
NZ Broadleaf/Kāpuka					
NZ Broom/Mākaka					
NZ Myrtle/Rōhutu					
Shrubby tororaro/Tororaro					
<i>Teucrium parvifolium</i>					
Weeping kōwhai/Kōwhai					
Willow-leaf hebe/Koromiko					
Wire vine/Pōpōhue					
Wire-netting bush/Korokio					

Crops pollinated



CROP

Apple
Blueberries
Brassicas
Carrot
Lucerne
Onion
Pear
Radish
Squash
Strawberries
White clover

assumed	verified good	verified excellent
---------	---------------	--------------------

Pest species targeted



PEST

Aphids	
Codling moth	
Diamondback moth	
Grass grub	
Greasy cutworm	
Leafroller caterpillars	
Mealybug	
Porina	
Potato tuber moth	
Scale	
Tomato fruitworm	
Tomato-potato psyllid	
White butterfly	

6 *Leioproctus* bees



Leioproctus bees are a group of native solitary bees found mainly in Australasia and are one of the main groups of native bees in Aotearoa New Zealand, with around 18 described species⁽³⁶⁾. Although Aotearoa New Zealand has relatively few native bee species, these bees can play a valuable role in pollination in farmland systems⁽³⁷⁾. *Leioproctus* bees are larger than other native bees (around 10–12mm long)⁽³⁶⁾, making them more visible on flowers. They are commonly associated with native vegetation, but most species also visit exotic plants⁽³⁶⁾.

Although typically less abundant than smaller sweat bees, *Leioproctus* bees can be highly effective crop pollinators. Studies have shown they can transfer similar amounts of pollen to honey bees in crops such as brassica, onion and carrot⁽³⁷⁾, and some species are thought to contribute to pollination of white clover⁽⁸⁾. Their activity is concentrated over the warmer months, meaning they are particularly important for summer-flowering crops⁽³⁷⁾.



Adult *Leioproctus imitatus* visiting Kānuka flowers.



Adult *Leioproctus* bee emerging from a nesting hole.



Adult *Leioproctus imitatus* visiting Kānuka flowers.

Life-cycle (*Leioproctus* bees)

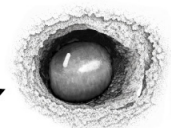
Leioproctus bees have a simple life-cycle: egg > larva > pupa > adult, with all immature stages developing underground⁽³⁶⁾.

Leioproctus bees have one generation per year and 15 species are found in Canterbury.

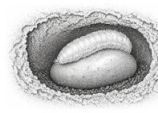
Brood cells are dug in the ground, where the bee forms a pollen and nectar ball and lays a single egg on top⁽³⁸⁾. Nests are often clustered and identified by loose soil around small (~6mm) holes. Aggregations can be dense, exceeding 20 holes per m², and occur along native plant margins, bare fence lines and vehicle tracks⁽³⁸⁾.



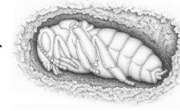
Adult bees emerge in late spring to early summer and are active until late summer/early autumn. Adults are black in colour, with one species having orange hairs. They visit flowers in native plantings, crops, and field margins during late spring and summer⁽³⁷⁾. Nesting begins in late spring, with adults emerging from holes in bare ground.



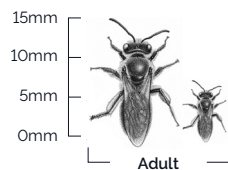
Larvae develop underground (20–50cm deep)⁽³⁸⁾ from summer to autumn, before overwintering as pre-pupae.



Pupation occurs in spring and adults emerge soon after.

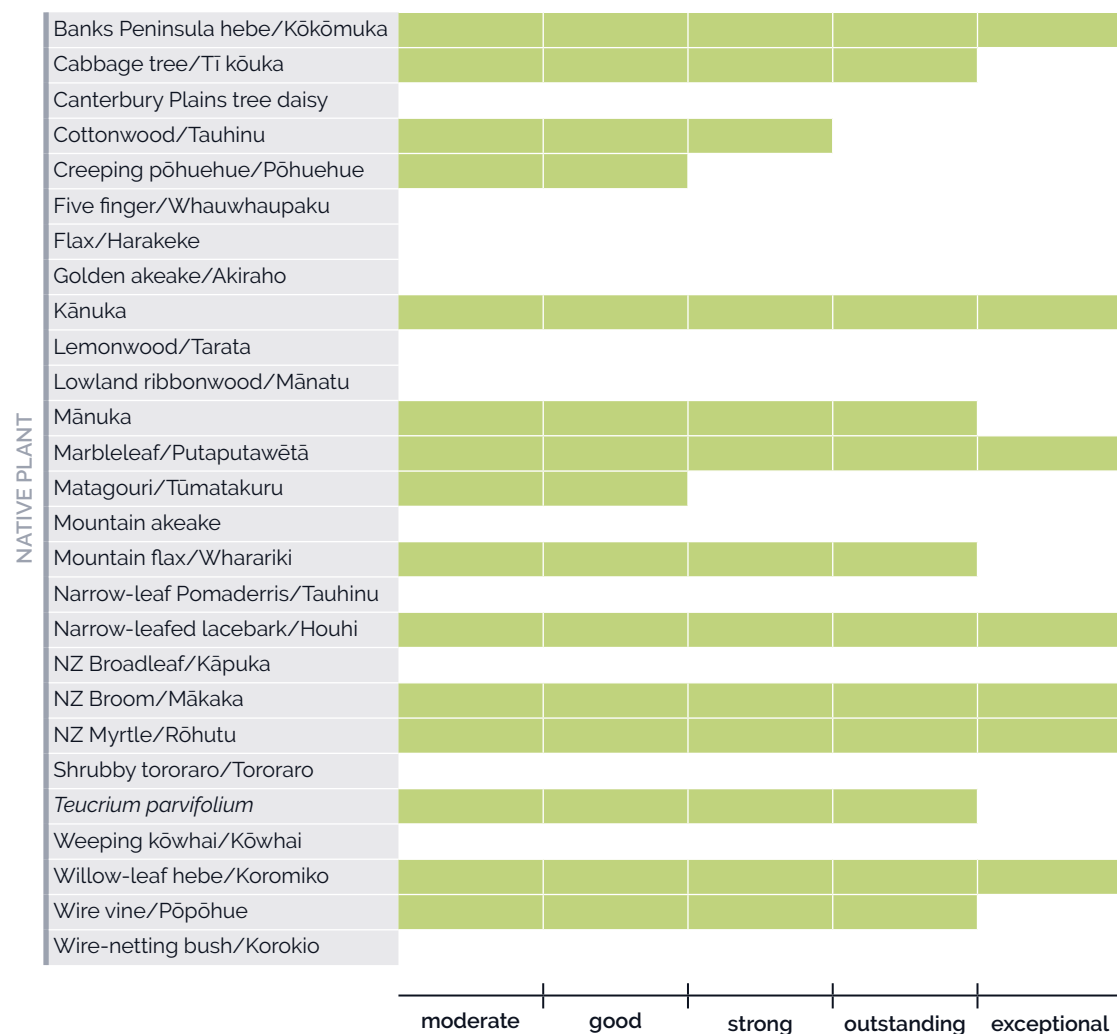


Actual size (*Leioproctus* bees)

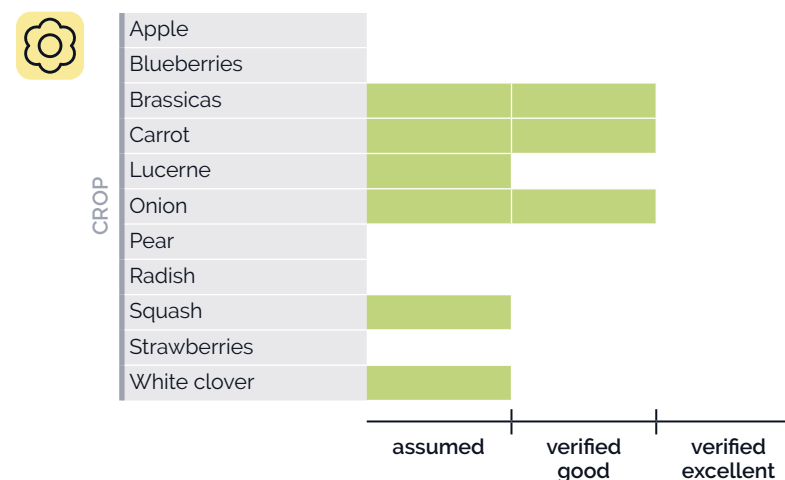


Leioproctus bees in Canterbury range in size from 6.5–>13.4mm depending on the species.

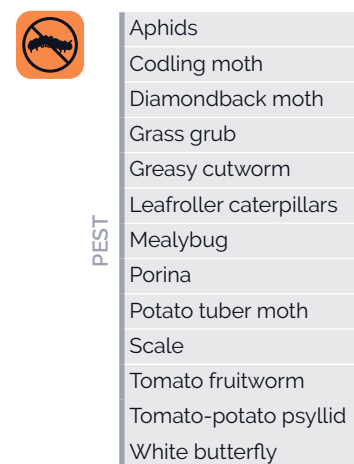
Attraction to native plant (*Leioproctus* bees)



Crops pollinated



Pest species targeted



7 Sweat bees



Sweat bees are small, ground-nesting bees that play an important role in pollination. Worldwide there are over 1800 species⁽⁴⁰⁾, but Aotearoa New Zealand has just four known species⁽³⁶⁾. Despite their small size (around 4–6mm), they are often very abundant and can be among the most common insects visiting flowers in farmland and native plantings⁽³⁶⁾.

The Aotearoa New Zealand species *Lasioglossum sordidum* is the most widespread and abundant native bee in Canterbury and much of the eastern South Island⁽³⁶⁾. It visits a very wide range of native and introduced plants (>130 species across >50 plant families) and has been recorded on at least 16 crop species, where it can be abundant within fields⁽³⁷⁾. Although individual bees carry less pollen than larger species⁽⁴¹⁾, their high numbers mean they can make an important contribution to crop pollination⁽³⁷⁾. In some crops, such as carrot, they have been shown to be as effective as larger bees at transferring pollen⁽³⁷⁾.



Adult *Lasioglossum sordidum* bee.



Adult *Lasioglossum sordidum* bees visiting Wire-netting bush flowers.



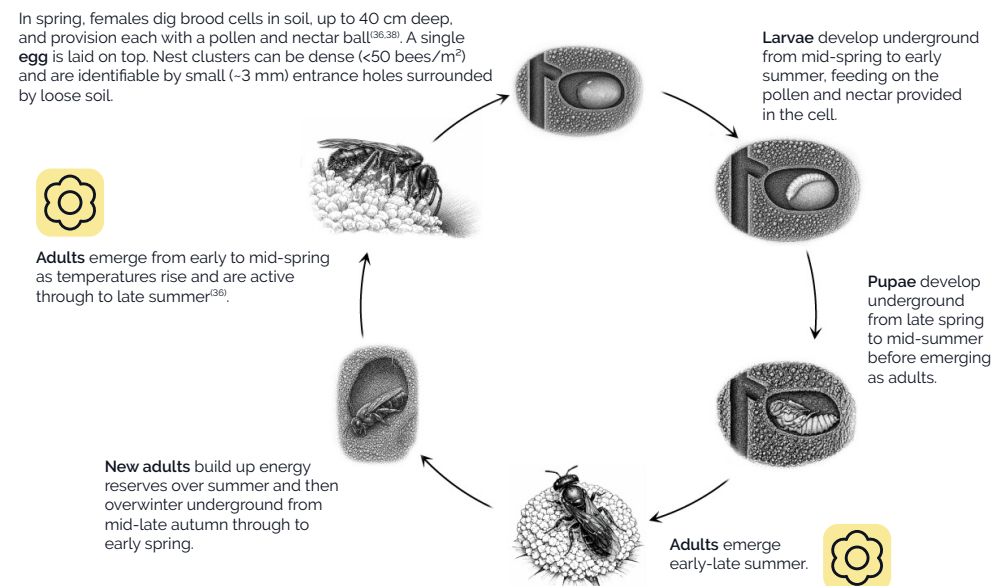
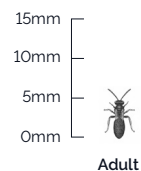
Adult *Lasioglossum sordidum* bee.

Life-cycle (Sweat bee)

Sweat bees have a simple life-cycle: egg > larva > pupa > adult, with all immature stages developing underground⁽³⁶⁾.

There is one generation per year, though adults from the previous and new generations may overlap during summer.

Actual size (Sweat bee)



Attraction to native plant (Sweat bee)

NATIVE PLANT					
	moderate	good	strong	outstanding	exceptional
Banks Peninsula hebe/Kōkōmuka					
Cabbage tree/Tī kōuka					
Canterbury Plains tree daisy					
Cottonwood/Tauhinu					
Creeping pōhuehue/Pōhuehue					
Five finger/Whauwhaupaku					
Flax/Harakeke					
Golden akeake/Akiraho					
Kānuka					
Lemonwood/Tarata					
Lowland ribbonwood/Mānatu					
Mānuka					
Marbleleaf/Putaputawētā					
Matagouri/Tūmatakuru					
Mountain akeake					
Mountain flax/Wharariki					
Narrow-leaf Pomaderris/Tauhinu					
Narrow-leafed lacebark/Houhi					
NZ Broadleaf/Kāpuka					
NZ Broom/Mākaka					
NZ Myrtle/Rōhutu					
Shrubby tororaro/Tororaro					
<i>Teucrium parvifolium</i>					
Weeping kōwhai/Kōwhai					
Willow-leaf hebe/Koromiko					
Wire vine/Pōpōhue					
Wire-netting bush/Korokio					

Crops pollinated

CROP			
	assumed	verified good	verified excellent
Apple			
Blueberries			
Brassicas			
Carrot			
Lucerne			
Onion			
Pear			
Radish			
Squash			
Strawberries			
White clover			

Pest species targeted

PEST		
	assumed	verified good
Aphids		
Codling moth		
Diamondback moth		
Grass grub		
Greasy cutworm		
Leafroller caterpillars		
Mealybug		
Porina		
Potato tuber moth		
Scale		
Tomato fruitworm		
Tomato-potato psyllid		
White butterfly		

SECTION 5 – **Native plant factsheets**

Canterbury has a wide range of native plants that can grow in all sorts of conditions. Whether you have dry or wet areas, different soil types, or spots under powerlines or irrigation systems, there are native species that will fit and help boost the beneficial insects you want on your farm.

In this guide, we highlight 27 plant species and give some general information about where they tend to grow best and how tall they get. This should help you start thinking about what might suit your site.

We strongly recommend having a chat with a local planting expert before you get started. They can give you more detailed advice on species selection and layout to make sure your planting works well and sets you up for long-term success.



Understanding each native plant factsheet

Name	Common name, Māori name, (<i>biological name</i>).
Summary description	A short-written summary of the characteristics and behaviours of the named plant, along with traditional knowledge and uses shared by local Māori iwi.
Photos	High resolution photos to support positive identification of the named plant.
Flowering season	Indicates the peak months of the year that the named native plant tends to produce flowers – thus providing an attractive habitat and/or food source for beneficial insects. This is a key consideration for planning a diverse plant selection that flower at different times to ensure beneficial insects have a steady supply of food throughout the season.
Plant appeal to pollinators	The pollinating insect's attraction to the named plant's flowers to varying degrees, when in full bloom. The number of green boxes alongside each pollinator, indicates how frequently this insect is likely to visit the named plant as a habitat and/or food source.  = moderate appeal [≥1 individual/plant recorded at >20% of research sites]  = good appeal [≥5 individuals/plant recorded at >20% of research sites]  = strong appeal [≥8 individuals/plant recorded at >40% of research sites]  = outstanding appeal [≥10 individuals/plant across >80% of research sites]  = exceptional appeal [≥20 individuals per plant across >90% of research sites]

Plant appeal to pest exterminators



The pest exterminating insect's attraction to the named plant's flowers, to varying degrees, when in full bloom. The number of green boxes alongside each pest exterminator, indicates how frequently this insect is likely to be found on the named plant.

-  = **moderate** appeal
 [≥1 individual/plant recorded at >20% of research sites]
-  = **good** appeal
 [≥5 individuals/plant recorded at >20% of research sites]
-  = **strong** appeal
 [≥8 individuals/plant recorded at >40% of research sites]
-  = **outstanding** appeal
 [≥10 individuals/plant across >80% of research sites]
-  = **exceptional** appeal
 [≥20 individuals per plant across >90% of research sites]

Detailed plant and growing characteristics

A guide to the ideal growing conditions and key plant characteristics of each plant. Essential for consideration when selecting plants to suit a specific need and site. NB: all plant selections should be discussed with a native plant expert/nursery before investment.



1 Banks Peninsula hebe/Kōkōmuka (*Veronica strictissima*)



When kōkōmuka plants flower in early summer, they support a large diversity of beneficials including hover flies, bees, soldier flies and brown lacewing. In fact, at least 58 different insect species have been recorded visiting the white flowers of kōkōmuka across Canterbury farmland.

Kōkōmuka is a small shrub with a medium growth rate, reaching only up to 2m tall and 2m wide at maturity, which allows it to be grown under pivot irrigation systems. It grows well in moist to dry sites, tolerates full sun to partial shade, and is frost tolerant.

Traditionally, Māori value kōkōmuka for its medicinal uses. It was used to treat ulcers, as well as kidney and bladder conditions⁽⁴²⁾.

Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

Image credit: Jon Sullivan (Flickr.com) - CC BY-NC 2.0



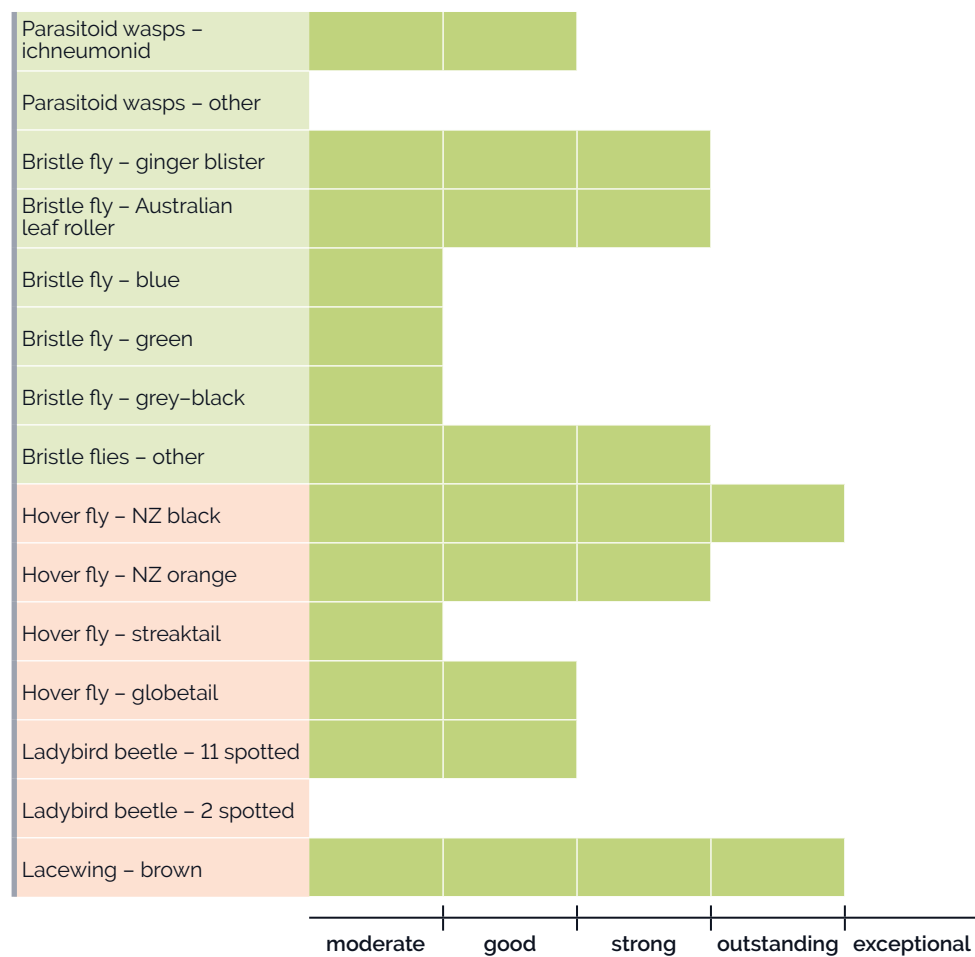
Pollinators



Pest exterminators

■ - Parasitoids

■ - Predators





2 Cabbage tree/Tī kōuka (*Cordyline australis*)

When tī kōuka plants flower in late spring, they are a champion for supporting populations of beneficials including hover flies, bees, march flies and soldier flies. Overall, at least 59 different insect species have been recorded visiting the sweetly scented flowers of tī kōuka across Canterbury farmland.

Tī kōuka is a moderate to fast-growing, medium-sized tree, reaching 4m tall within 5 years and up to 10m tall and 2m wide at maturity. This species is extremely hardy, tolerating dry through to wet sites, full sun through to full shade, and is frost tolerant.

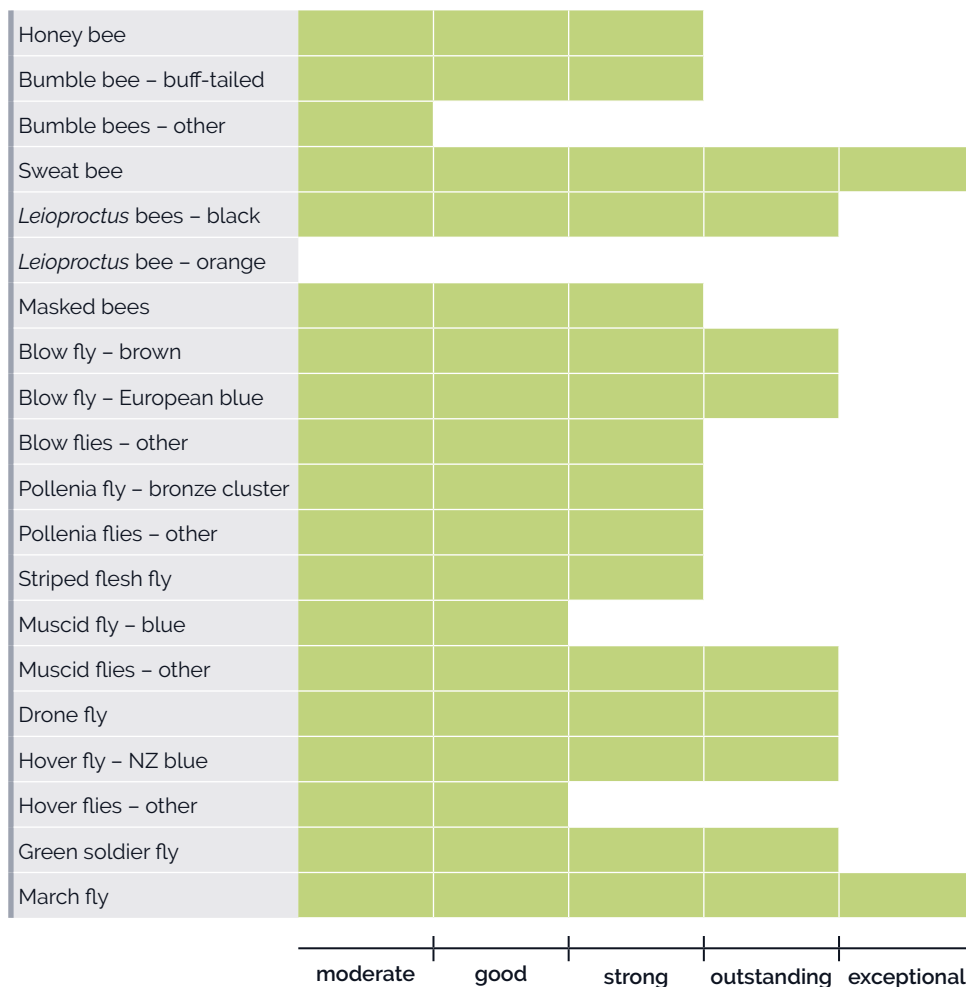
Traditionally, Māori value tī kōuka for its many medicinal and practical uses, as well as a source of food. Leaf juice was applied to wounds and used to treat stomach ailments, the leaves were used to make ropes, sandals, and cloaks, and the roots were cooked in earth ovens as a sweet carbohydrate-rich food. Trees were also planted as boundary and pathway markers⁽⁴³⁾.

Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug



Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





3 Canterbury Plains tree daisy (*Shawia* adenocarpa*)



*Formerly *Olearia adenocarpa*

Flowering in summer, *S. adenocarpa* plants play an important role in supporting populations of beneficials including hover flies, bees, bristle flies and soldier flies. At least 25 different insect species have been recorded visiting the pale white flowers of *S. adenocarpa* across Canterbury farmland.

Very rare in the wild, the *S. adenocarpa* is a small shrub with a moderate growth rate, reaching up to 1.5m tall and 1.5m wide at maturity, making it suitable for planting under pivot irrigation systems. It prefers dry sites with full sun and is frost tolerant.

Traditionally, Māori value *S. adenocarpa* for its medicinal and practical uses. The bark was used to make decoctions to treat skin irritations, and the branches were used as fuel⁽⁴⁵⁾.

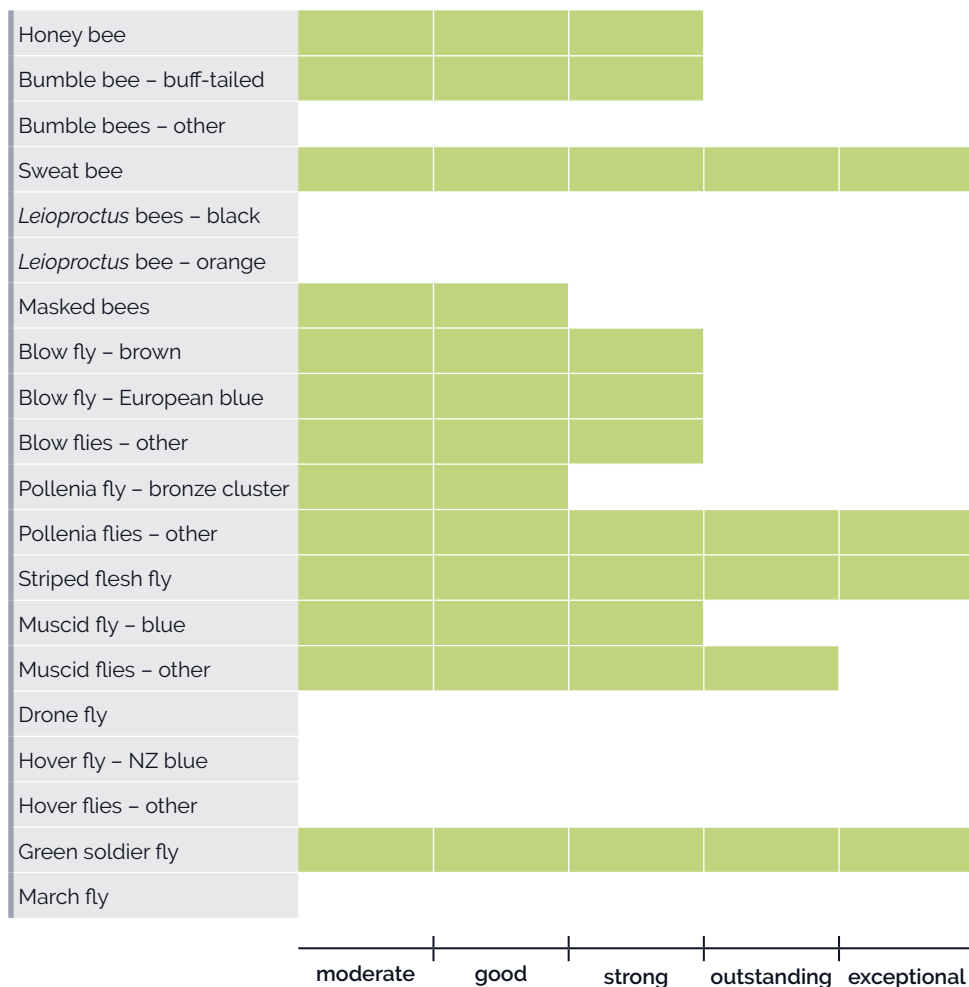
Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

Image credit: Debra Wotton, Moa's Ark Research.



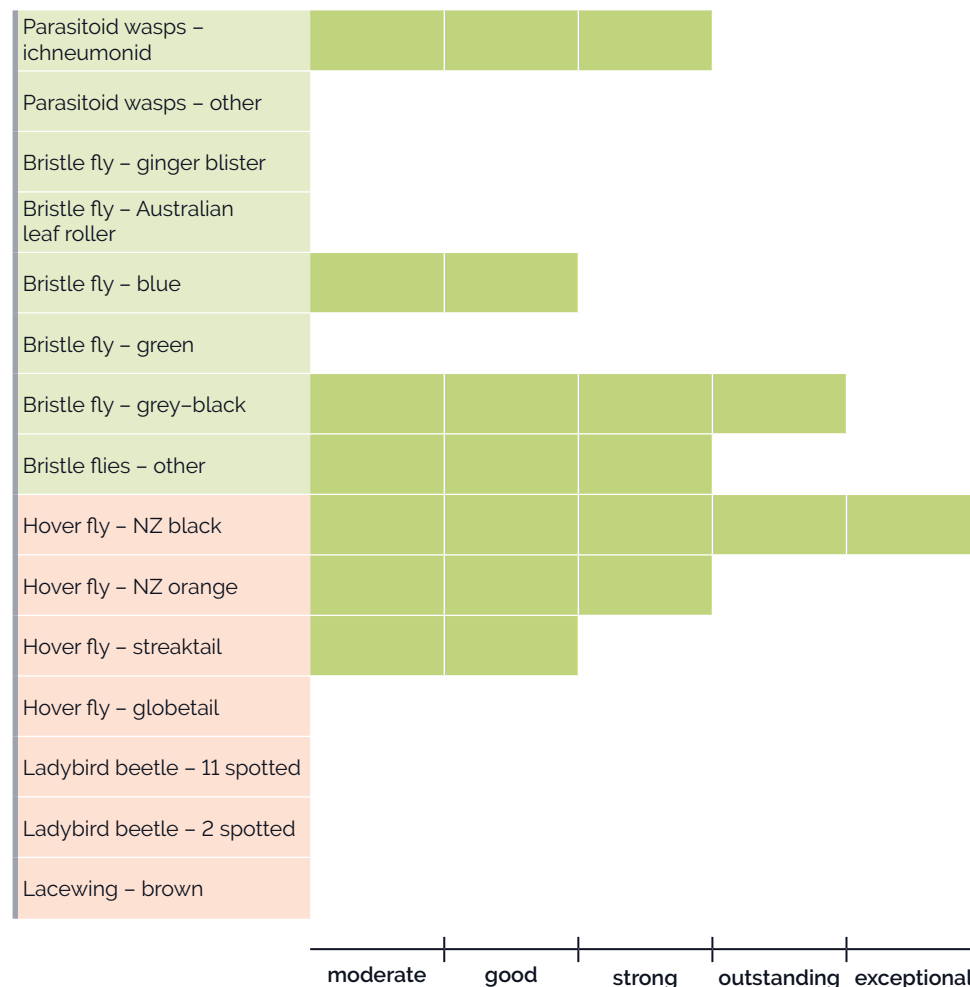
Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





4 Cottonwood/Tauhinu (*Ozothamnus leptophyllus*)

When tauhinu plants flower in summer, they support populations of beneficials including bristle flies, bees, cluster flies and soldier flies. At least 46 different insect species have been recorded visiting the white flowers of tauhinu across Canterbury farmland.

Tauhinu is a small shrub with a moderate growth rate, reaching up to 2m tall and 2m wide at maturity. It grows well in dry to moist sites, with full sun to partial shade and is frost tolerant.

Traditionally, Māori value tauhinu for its practical and medicinal uses. It's hard, durable wood, roots and branches were used for making fish hooks and in the construction of canoe parts. It was also used medicinally for the relief of chest troubles⁽⁴⁵⁾.

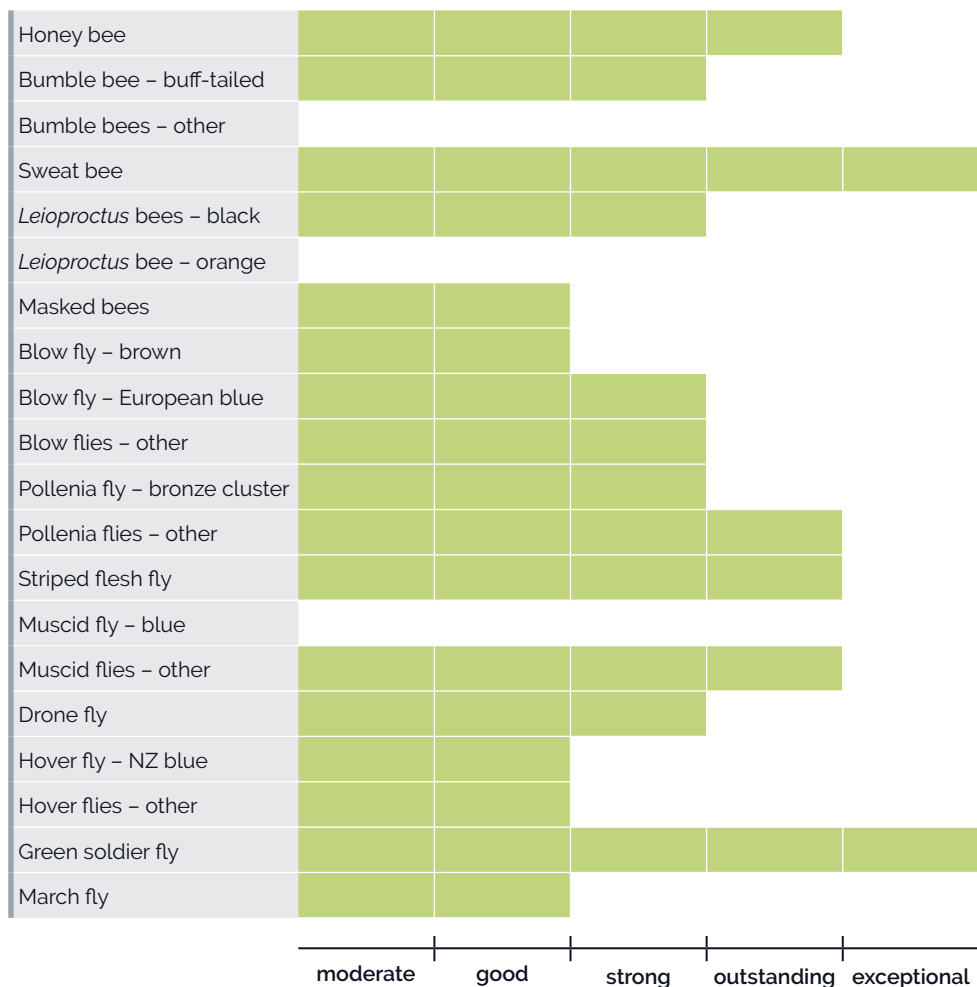
Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

Image credit: Peter J. de Lange, CC0, via Wikimedia Commons



Pollinators



Pest exterminators

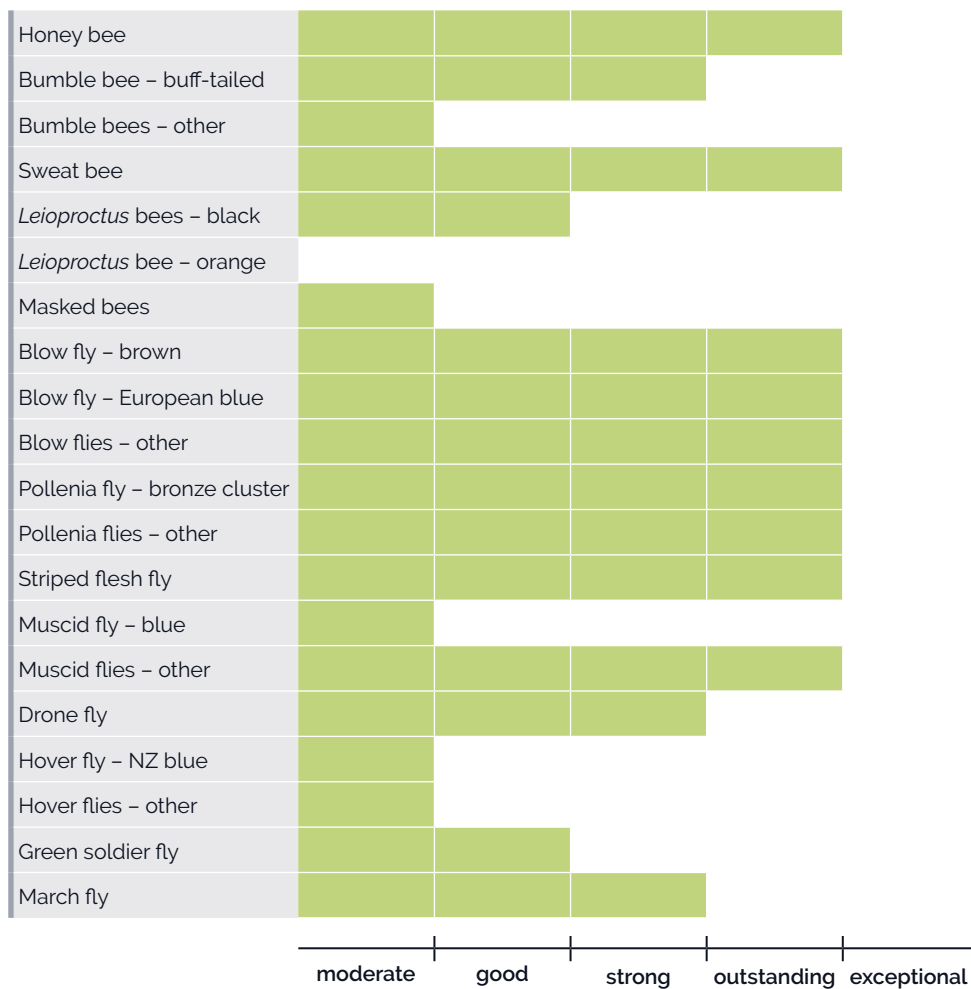
[Green square] = Parasitoids

[Orange square] = Predators





Pollinators



Pest exterminators

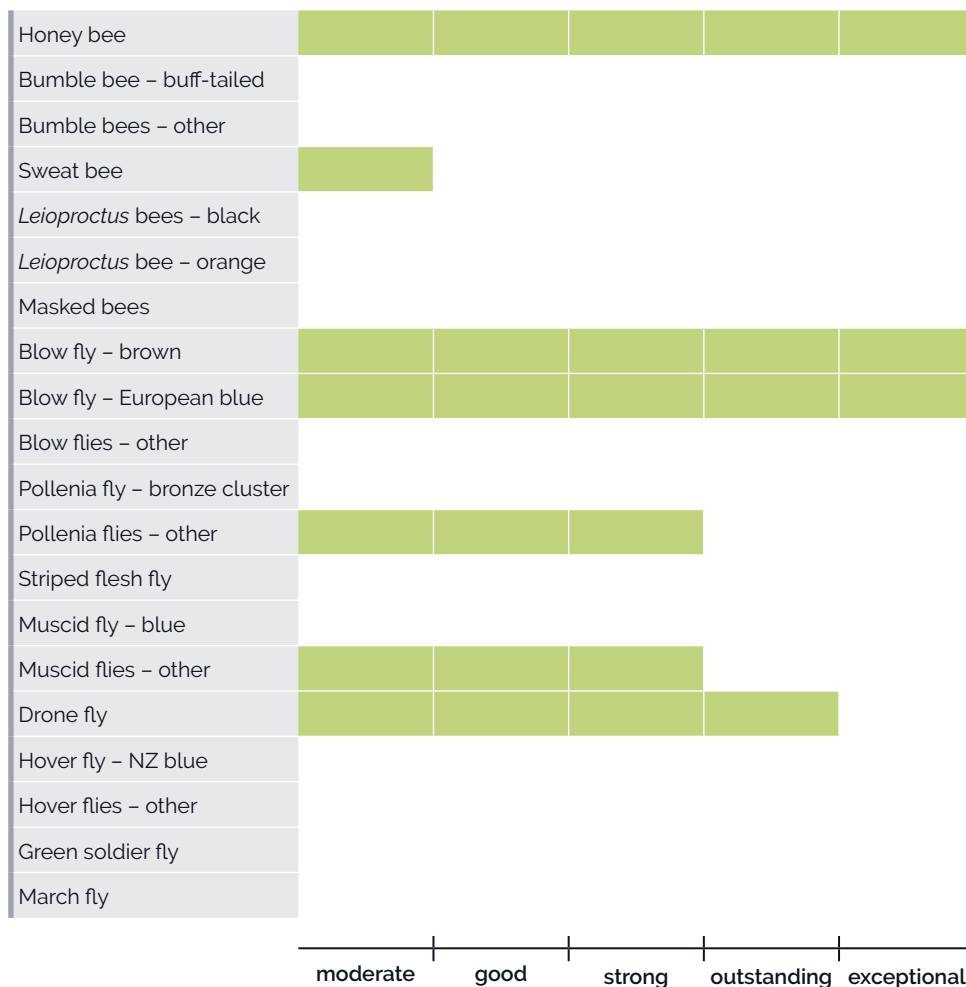
■ = Parasitoids

■ = Predators





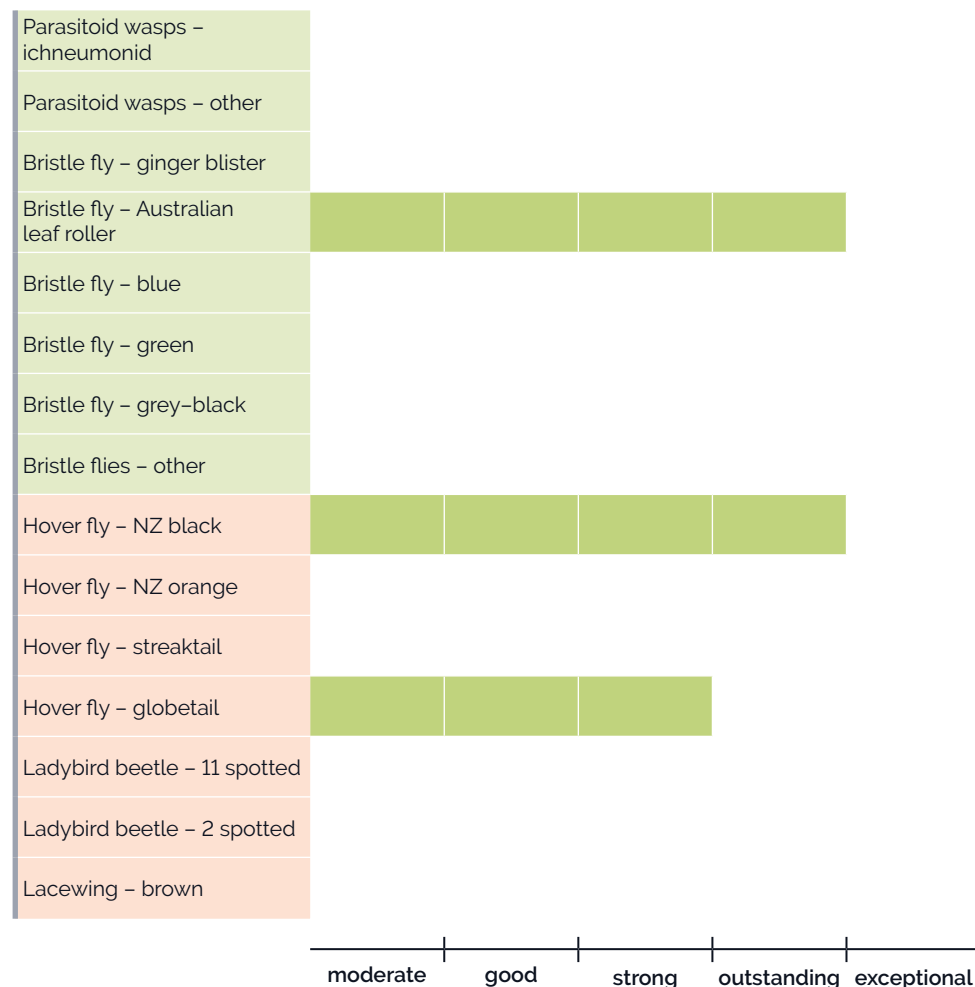
Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





7 Flax/Harakeke (*Phormium tenax*)

When harakeke plants flower in spring, they will support a variety of beneficial insects including hover flies, bees, ichneumonid wasps and ginger bristle flies. Overall, at least 29 different insect species have been recorded visiting the red flowers of harakeke across Canterbury farmland.

Harakeke is a fast-growing, hardy shrub, reaching 2m tall within 5 years and up to 3m tall and 2m wide at maturity. It grows well in wet, moist, or dry sites, tolerates full sun to partial shade, and is frost tolerant.

Traditionally, Māori value harakeke for its many practical and medicinal uses. Its leaves were woven into garments and mats, the sap was applied to burns, and the strong flower stalks were used as rafters for the roofs of simple structures⁽⁴³⁾.

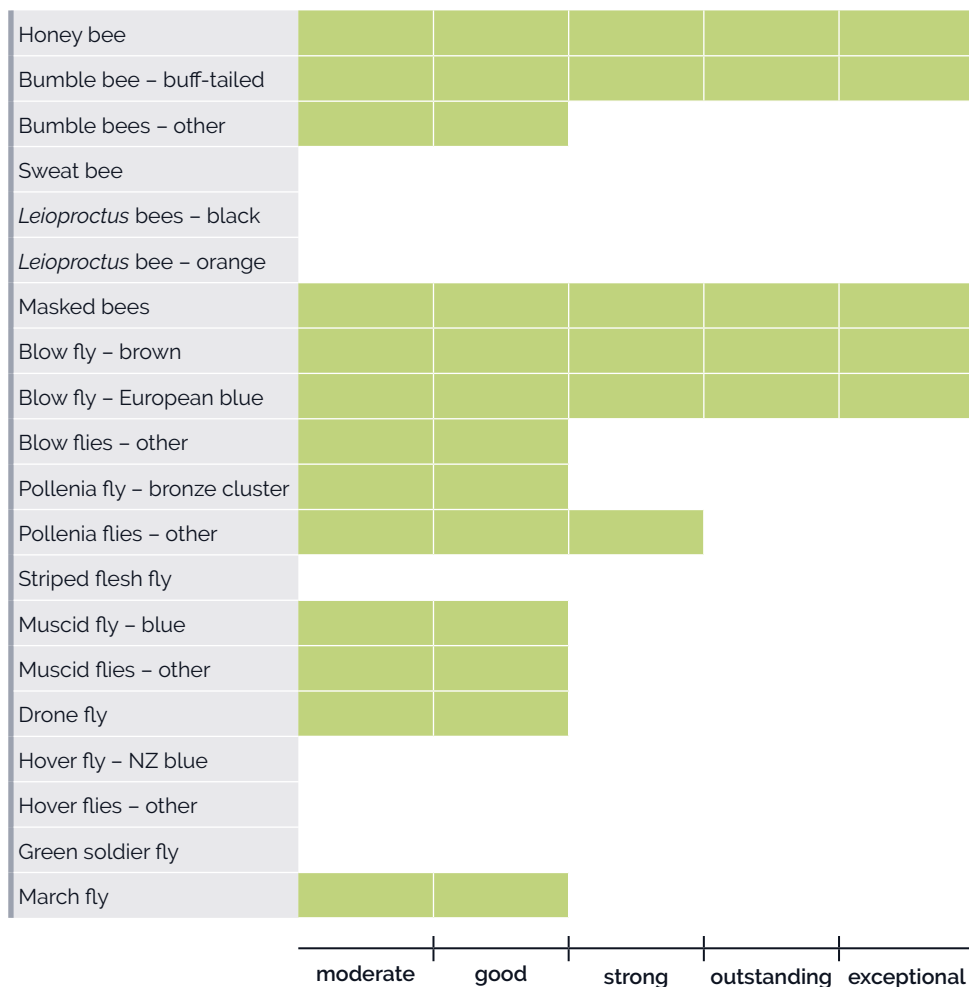
Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

Image credit: Krzysztof Golik, CC BY-SA 4.0, via Wikimedia Commons



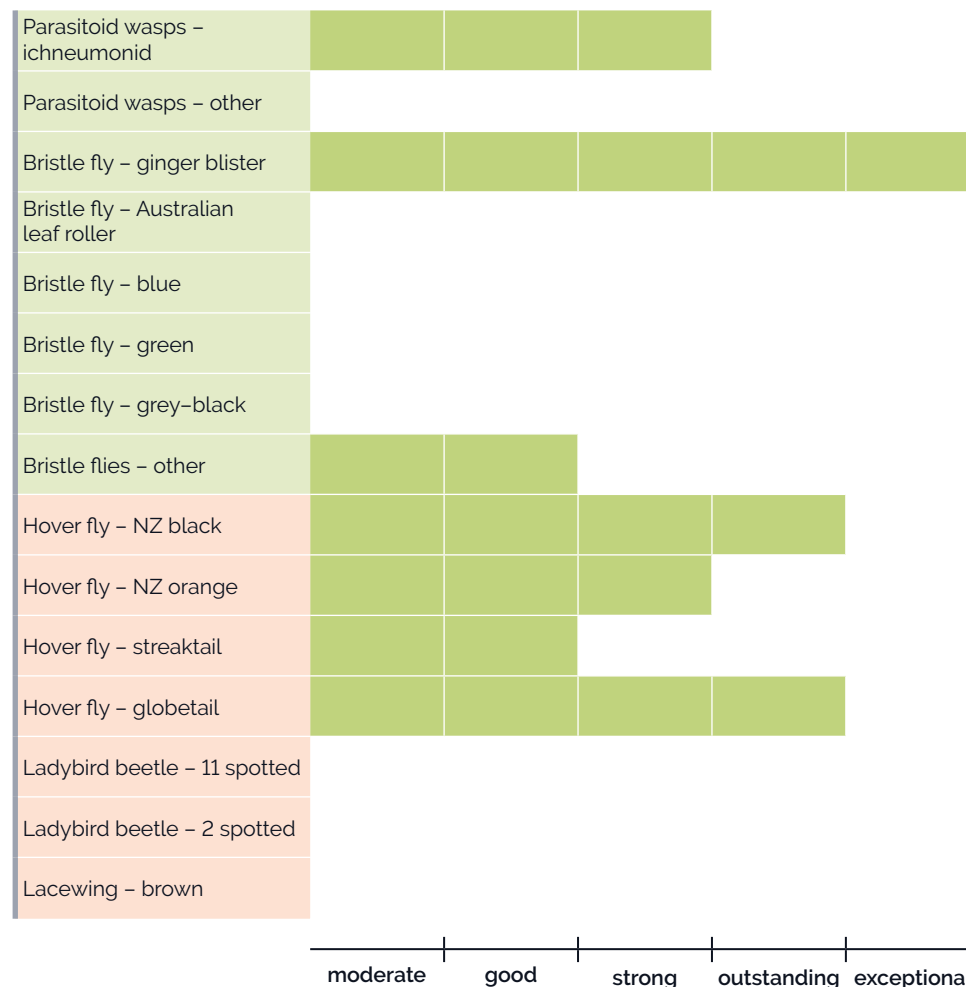
Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





8 Golden akeake/Akiraho (*Shawia* paniculata*)



*Formerly *Olearia paniculata*

When akiraho plants flower in autumn, a wide range of beneficials including hover flies, bees, cluster flies and blow flies will visit its small cream-coloured flowers. In fact, at least 44 different insect species have been recorded visiting akiraho flowers across Canterbury farmland.

Akiraho is a small, fast-growing tree, reaching 3m tall within 5 years and up to 4m tall and 2.5m wide at maturity. Intolerant of wet sites, but grows well in dry to moist soils, prefers full sun to partial shade, and is tolerant of frost.

Traditionally, Māori value akiraho for its practical and medicinal uses. Its leaves were applied to wounds to aid healing, and its wood was used for making handles and pegs⁽⁴³⁾.

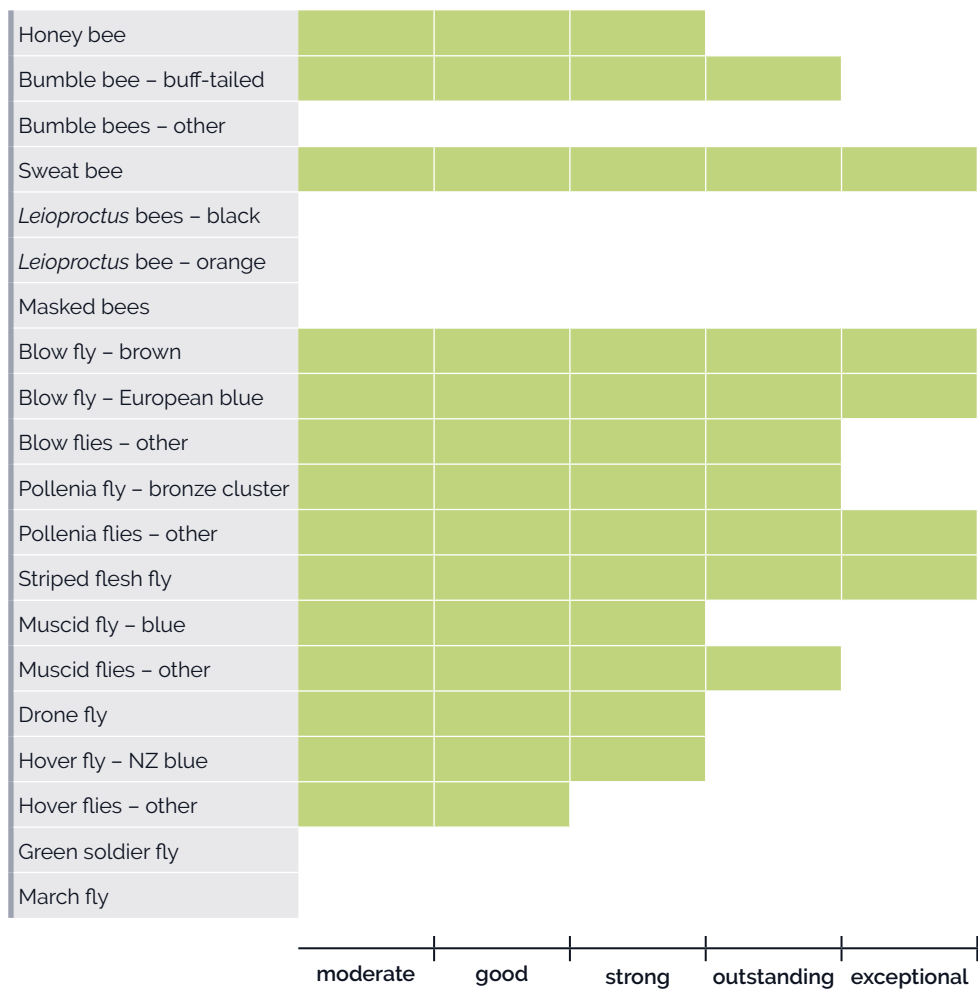
Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug





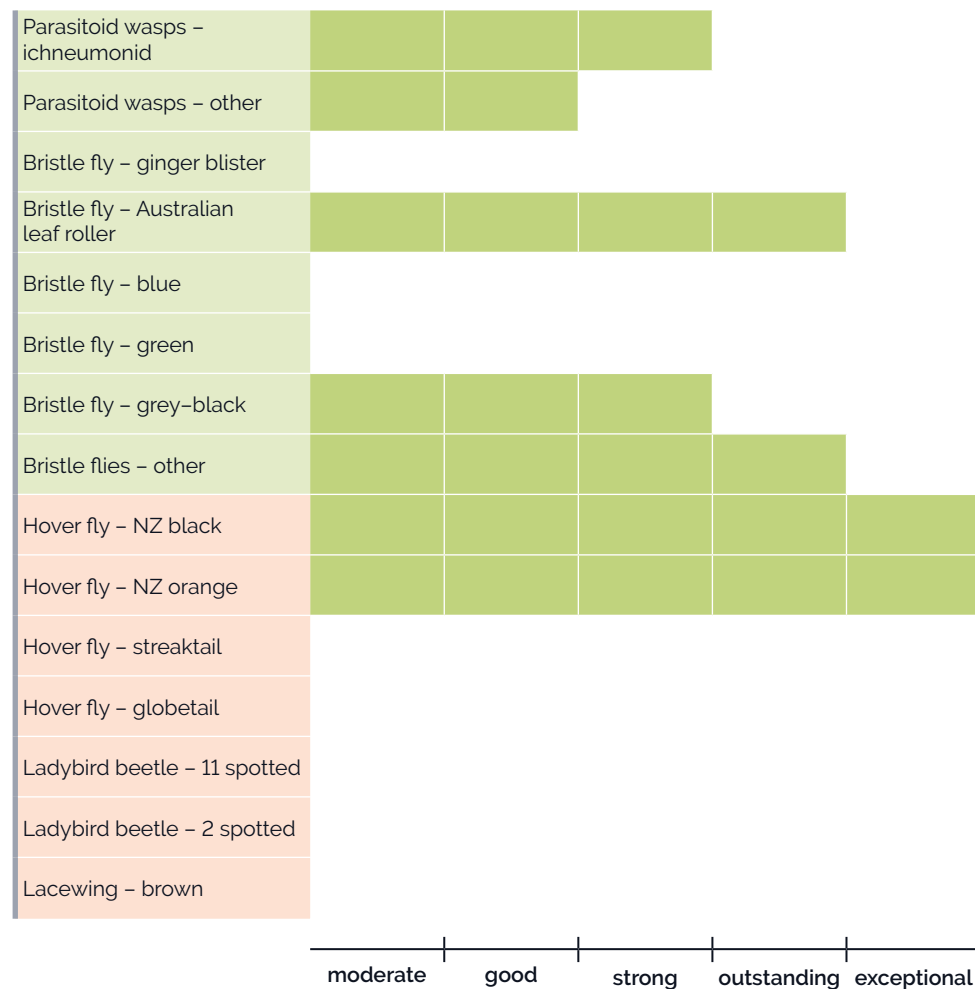
Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





9 Kānuka (*Kunzea ericoides*)



When kānuka plants flower in late spring, they are a champion for supporting populations of beneficials including hover flies, bees, march flies and soldier flies. Research has recorded at least 73 different insect species visiting kānuka flowers across Canterbury farmland.

Kānuka is a small, hardy tree with a medium growth rate, reaching 3m tall within 5 years and up to 8m tall and 3m wide at maturity. It thrives in dry to moist soils, prefers full sun to partial shade, and is moderately tolerant of frost.

Traditionally, Māori value kānuka for its medicinal and practical uses. Leaf infusions were used to treat skin and urinary conditions, and its dense hardwood was prized for tool-making and firewood⁽⁴³⁾.

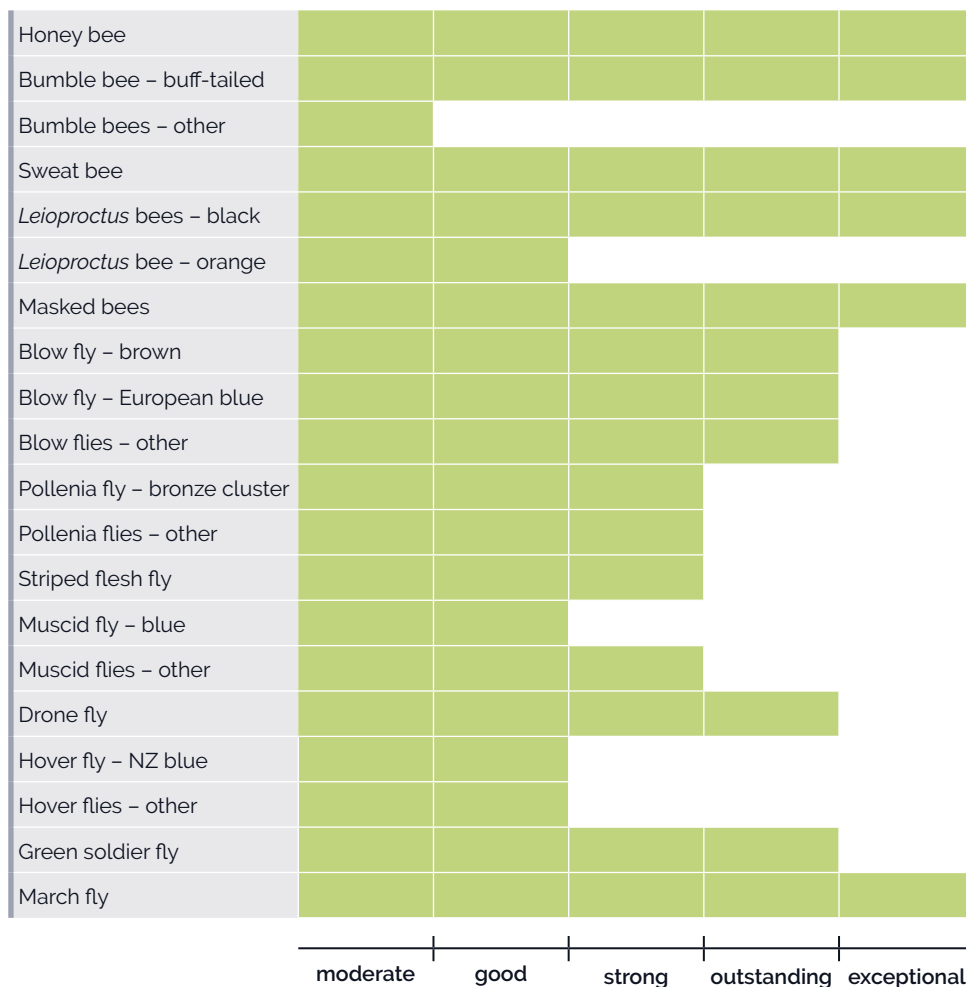
Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

Image credit should be: Peter de Lange, CCO, via Wikimedia Commons



Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





10 Lemonwood/Tarata (*Pittosporum eugenioides*)



Flowering in spring, tarata plants play an important role in supporting populations of beneficials including hover flies, native bees, Pollenia flies and blow flies. Tarata flowers support a diverse range of insects, with at least 26 species recorded visiting them across Canterbury farmland.

Tarata is a fast-growing, medium-sized tree, reaching 3m within 5 years and up to 12m tall and 3m wide at maturity. It prefers moist sites, grows well in full sun to full shade, and is frost tender when young.

Traditionally, Māori value tarata for its sweet fragrance and medicinal uses. The fragrant gum was used for body scenting and chewing, and leaf infusions were used to treat colds and sore throats⁽⁴²⁾.

Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug



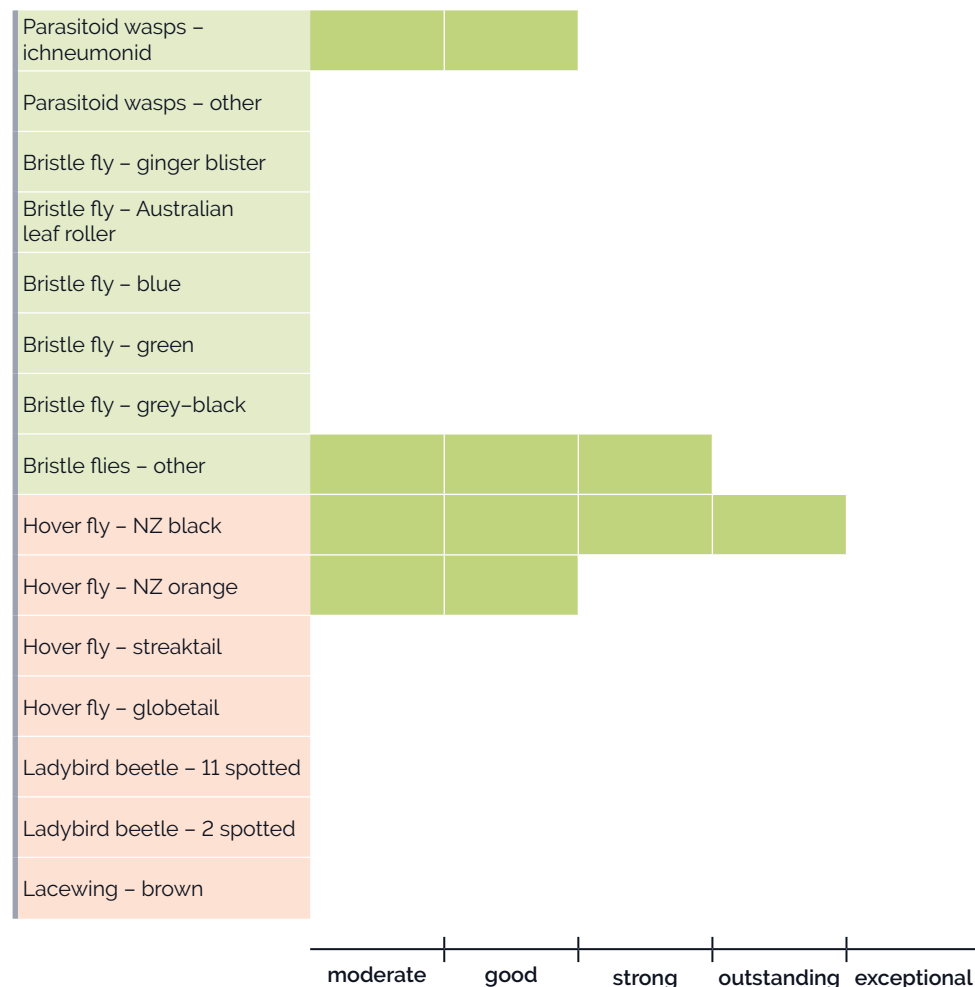
Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





11 Lowland ribbonwood/Mānatu (*Plagianthus regius*)



When mānatu plants flower in spring, they support a large diversity of beneficials including hover flies, bees, march flies and muscid flies. Despite having small green flowers, at least 33 different insect species have been recorded visiting mānatu flowers across Canterbury farmland.

Mānatu is a fast-growing, medium sized tree, reaching 4m tall within 5 years and 12m tall and 4m wide at maturity. It is a very hardy species, being wind-resistant and tolerating both dry and wet sites, as well as frost. Mānatu grows best in full sun to partial shade.

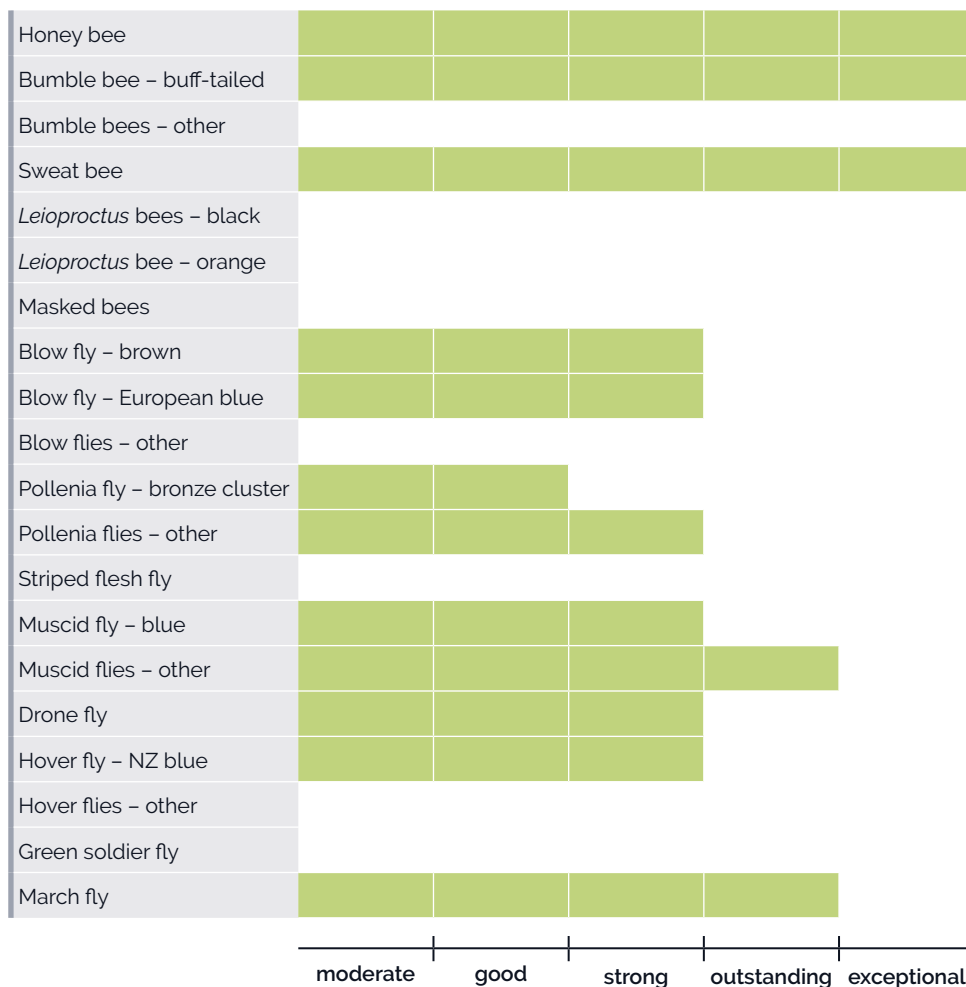
Traditionally, Māori value mānatu for its flexible wood, which was used for construction and implements. A decoction made from the bark was also used to treat fever and stomach ailments⁽⁴²⁾.

Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug



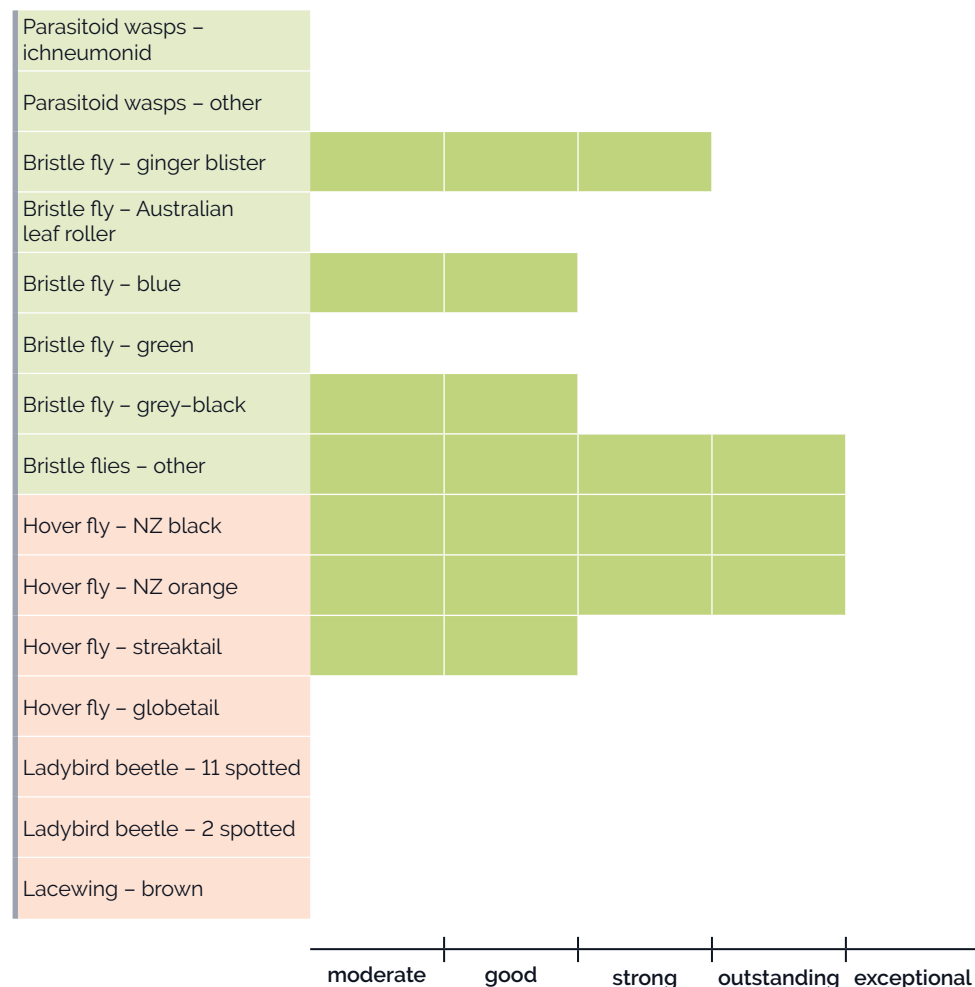
Pollinators



Pest exterminators

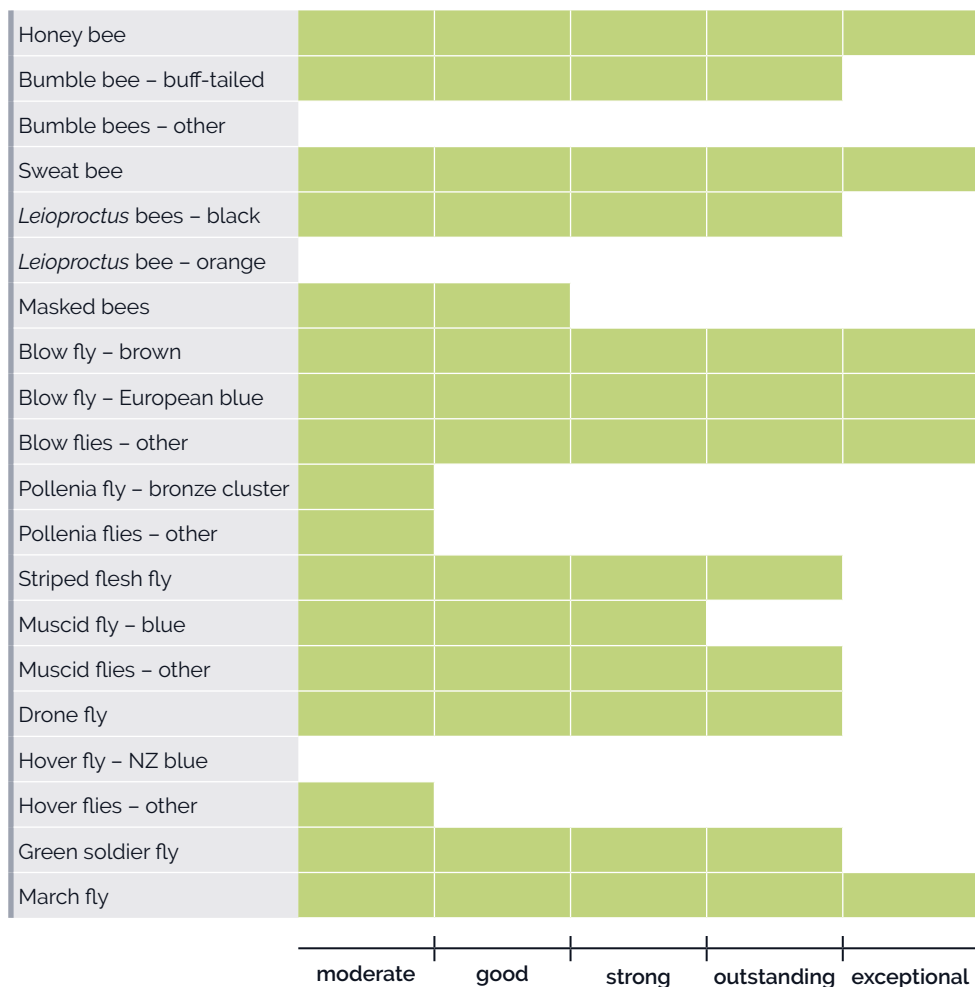
■ = Parasitoids

■ = Predators





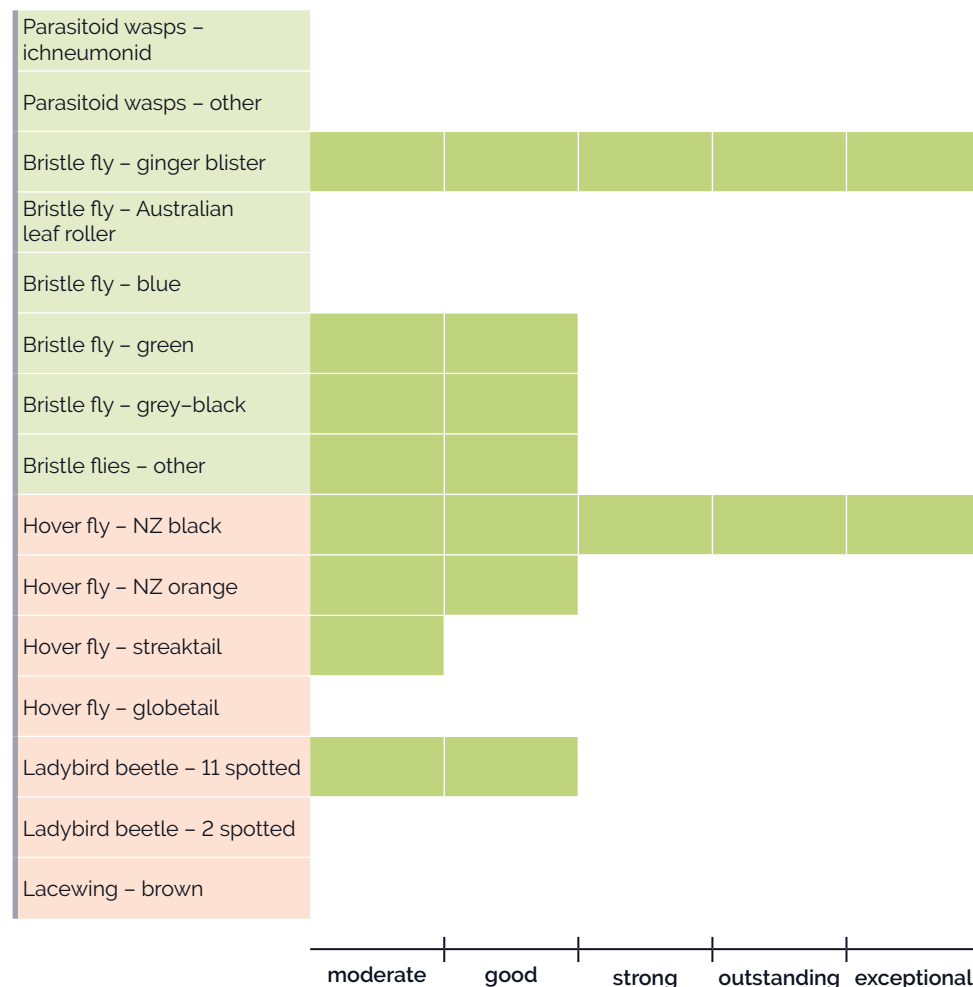
Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





13 Marbleleaf/Putaputawētā (*Carpodetus serratus*)



Flowering from late spring to early summer, putaputawētā supports a range of beneficial insects, including hover flies, bees, blow flies, and soldier flies. At least 21 insect species have been recorded visiting its white flowers across Canterbury farmland.

Putaputawētā is a medium tree with a moderate growth rate, reaching 6m tall within 5 years and up to 10m tall and 4m wide at maturity. It prefers wet to moist sites, tolerates full sun to partial shade, and is frost tender when young.

Traditionally, Māori value putaputawētā for its medicinal uses, particularly its leaves, but like many of our native plants, the deeper knowledge about this species hasn't been widely written down⁽⁴⁶⁾.

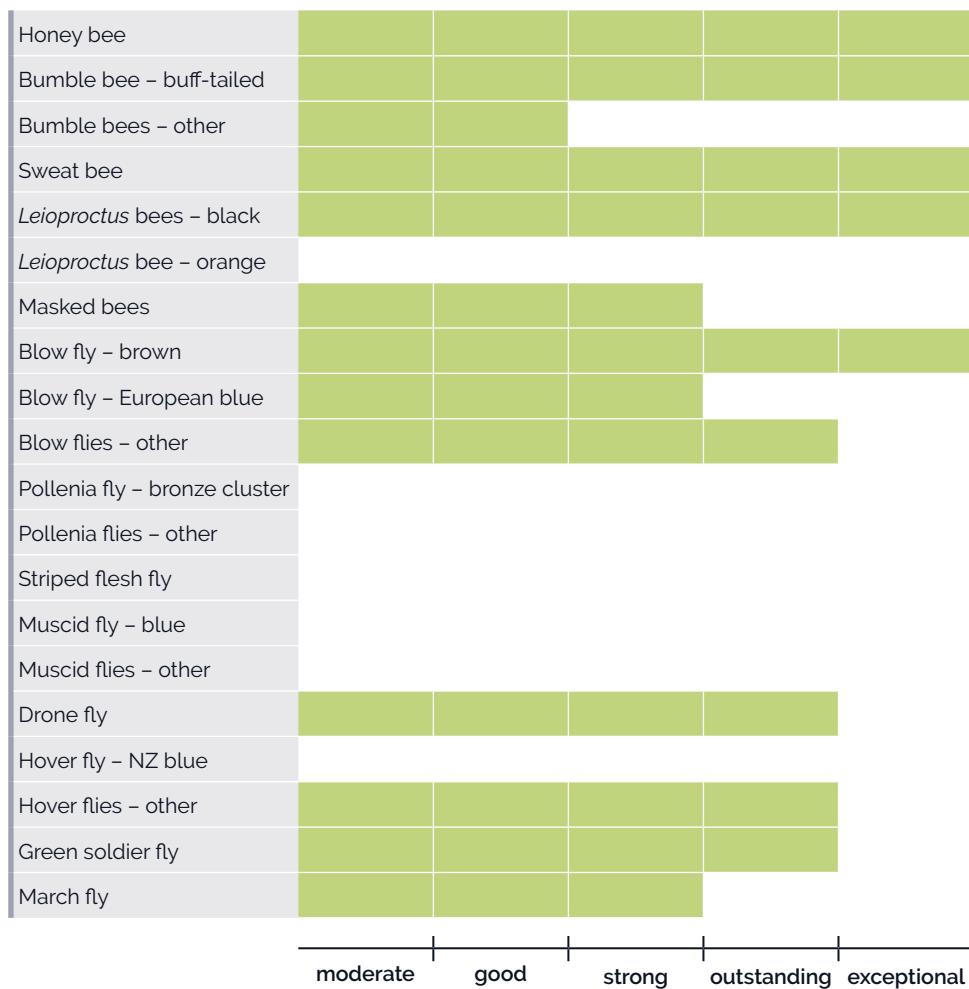
Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

Image credit: Krzysztof Golik, CC BY-SA 4.0, via Wikimedia Commons



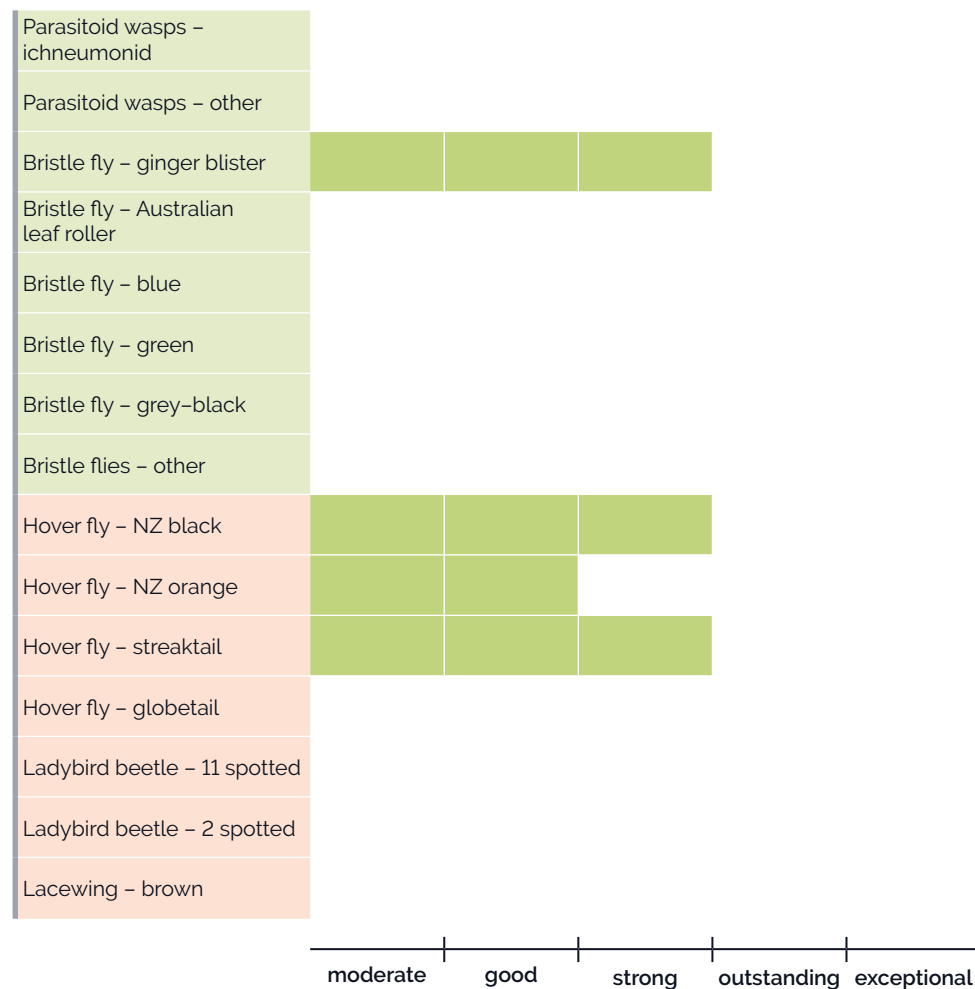
Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





14 Matagouri/Tūmatakuru (*Discaria toumatou*)



When tūmatakuru plants flower in spring, they play an important role in supporting beneficial insects, including bees, pollenia flies, muscid flies, and bristle flies. At least 34 different insect species have been recorded visiting tūmatakuru flowers across Canterbury farmland.

Tūmatakuru is a slow growing divaricating shrub, reaching 1.5m tall within 5 years and up to 5m tall and 3m wide at maturity. It prefers dry sites with full sun and is extremely frost tolerant.

Traditionally, Māori value tūmatakuru for its various practical uses. Its thorny branches were fashioned into fences, hedges, traps, fishhooks and other implements. The spines were also used for tattooing when other tools were unavailable⁽⁴²⁾.

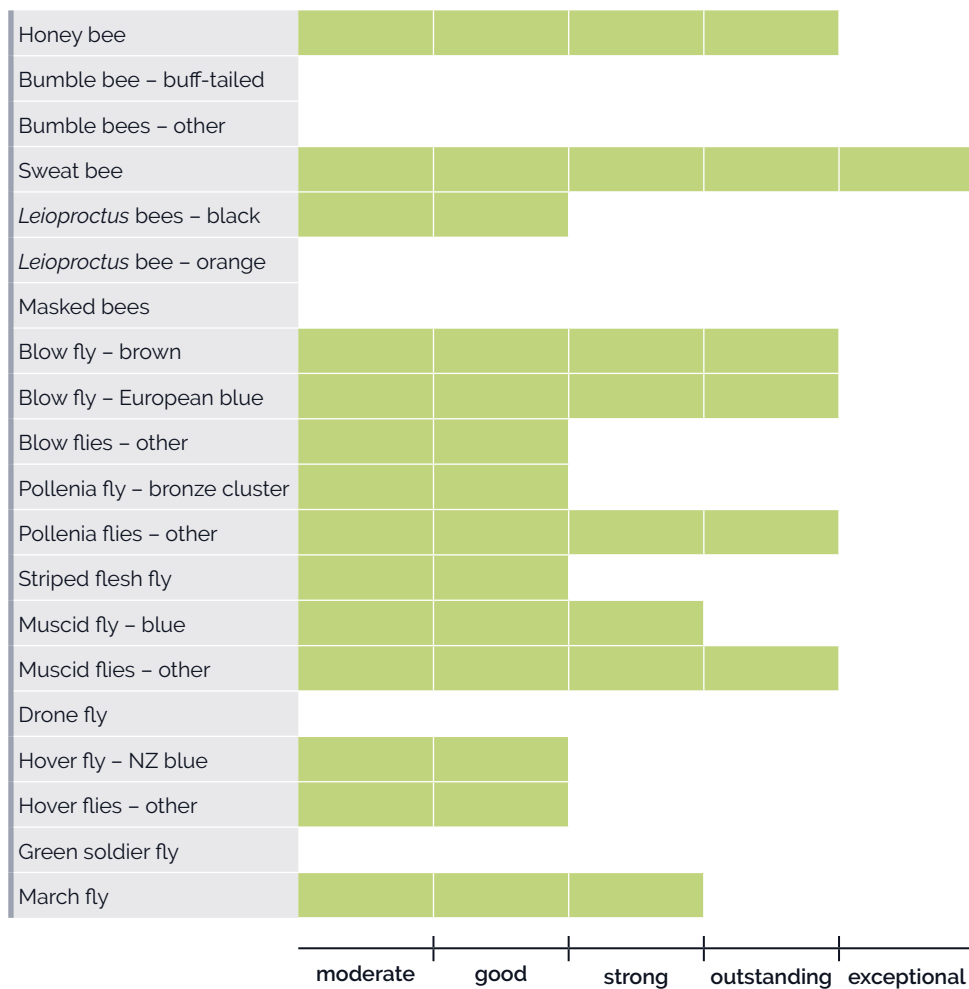
Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

Image credit: Christopher Stephens, CC BY-SA 4.0, via Wikimedia Commons



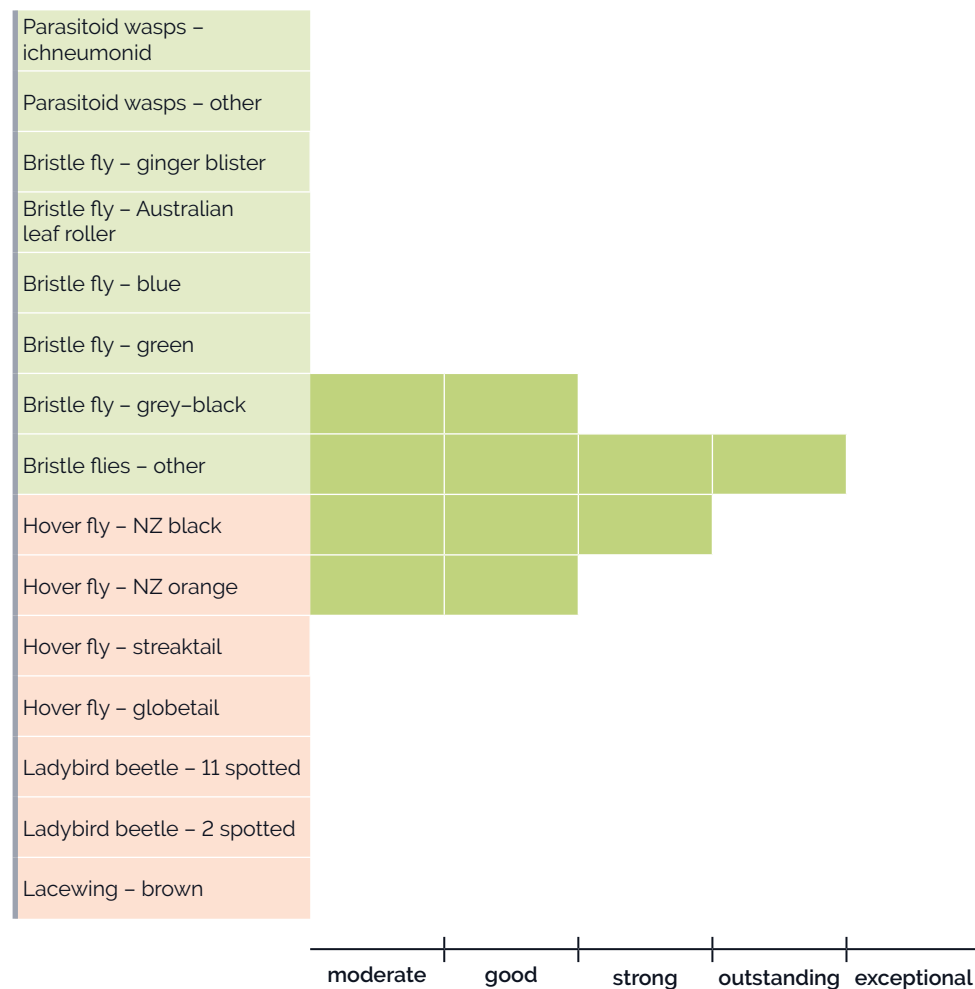
Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





15 Mountain akeake (*Shawia* avicenniifolia*)



*Formerly *Olearia avicenniifolia*

When mountain akeake plants flower in autumn, they support a large diversity of beneficials including bees, hover flies, blow flies and pollenia flies. At least 32 different insect species have been recorded visiting the small white flowers of mountain akeake across Canterbury farmland.

Mountain akeake is a small shrub with a moderate growth rate, reaching 2m tall within 5 years and 4m tall and 3m wide at maturity. It grows well in moist to dry sites, tolerates full sun to partial shade, and is frost tolerant.

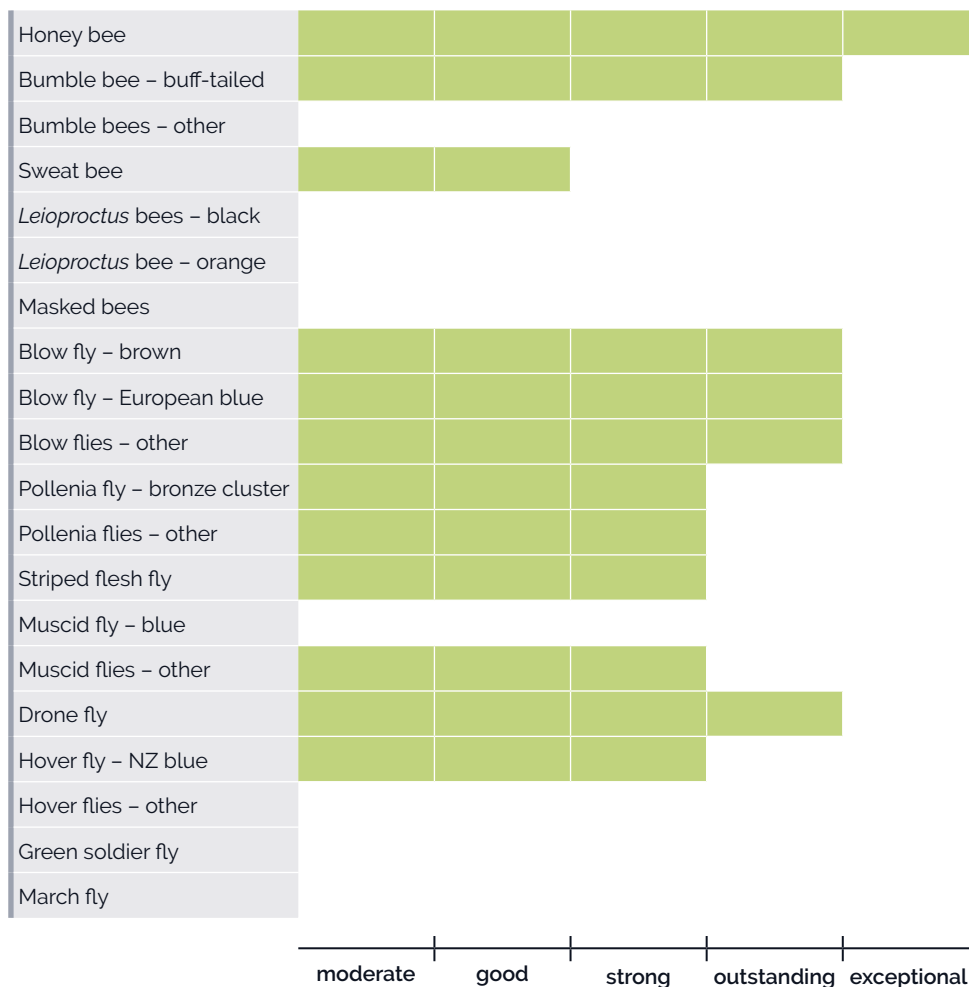
Traditionally, Māori value mountain akeake for its practical uses, particularly its hard, strong wood used to make tool handles, pegs and weaponry⁽⁴⁶⁾.

Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug



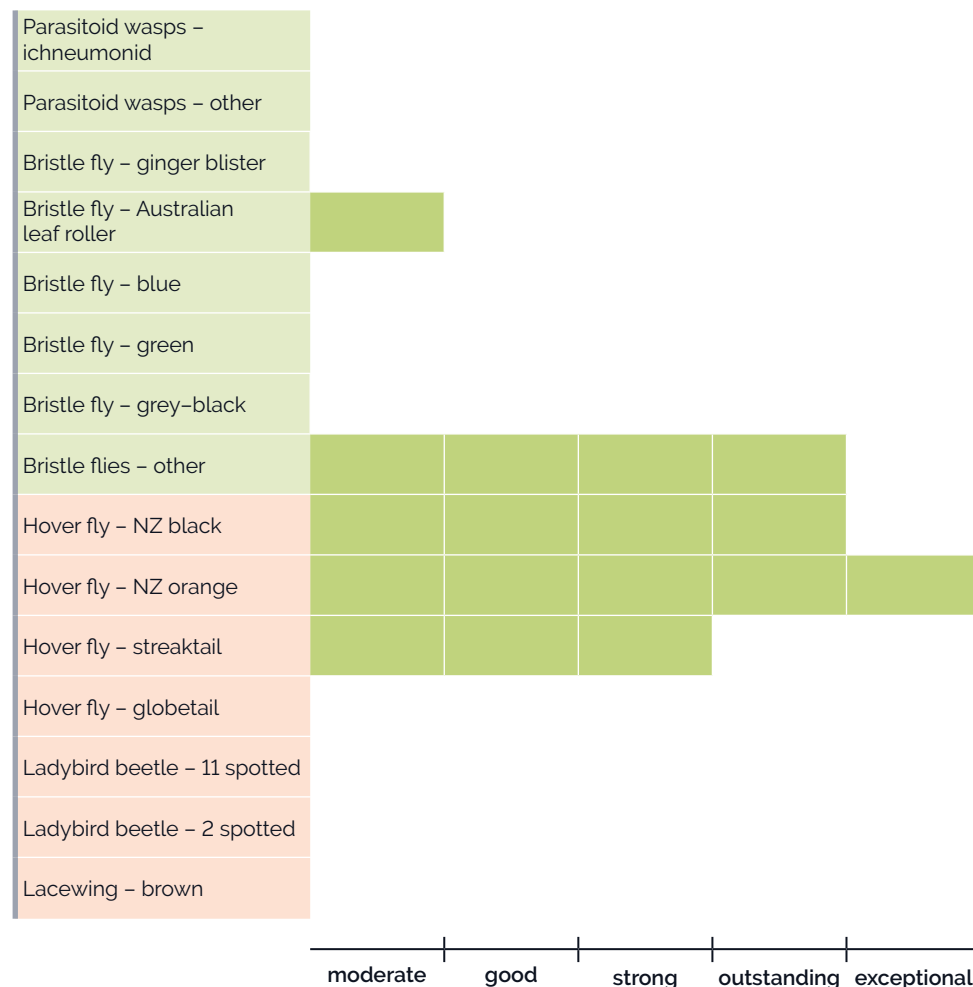
Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





16 Mountain flax/Wharariki (*Phormium cookianum*)

Flowering in late spring, wharariki supports a range of beneficial insects, including hover flies, bees, march flies, and muscid flies, with at least 27 insect species recorded visiting its yellow flowers across Canterbury farmland.

Wharariki is a fast-growing small shrub, reaching 1.5m tall and 1.5m wide at maturity, making it suitable for planting under pivot irrigation systems. It grows well in dry to moist sites, with full sun to partial shade and is extremely tolerant to dry, cold and exposed conditions.

Traditionally, Māori value wharariki for its medicinal and practical uses. The soft fibres were used for fine weaving, and the sap was used for its antiseptic properties⁽⁴²⁾.

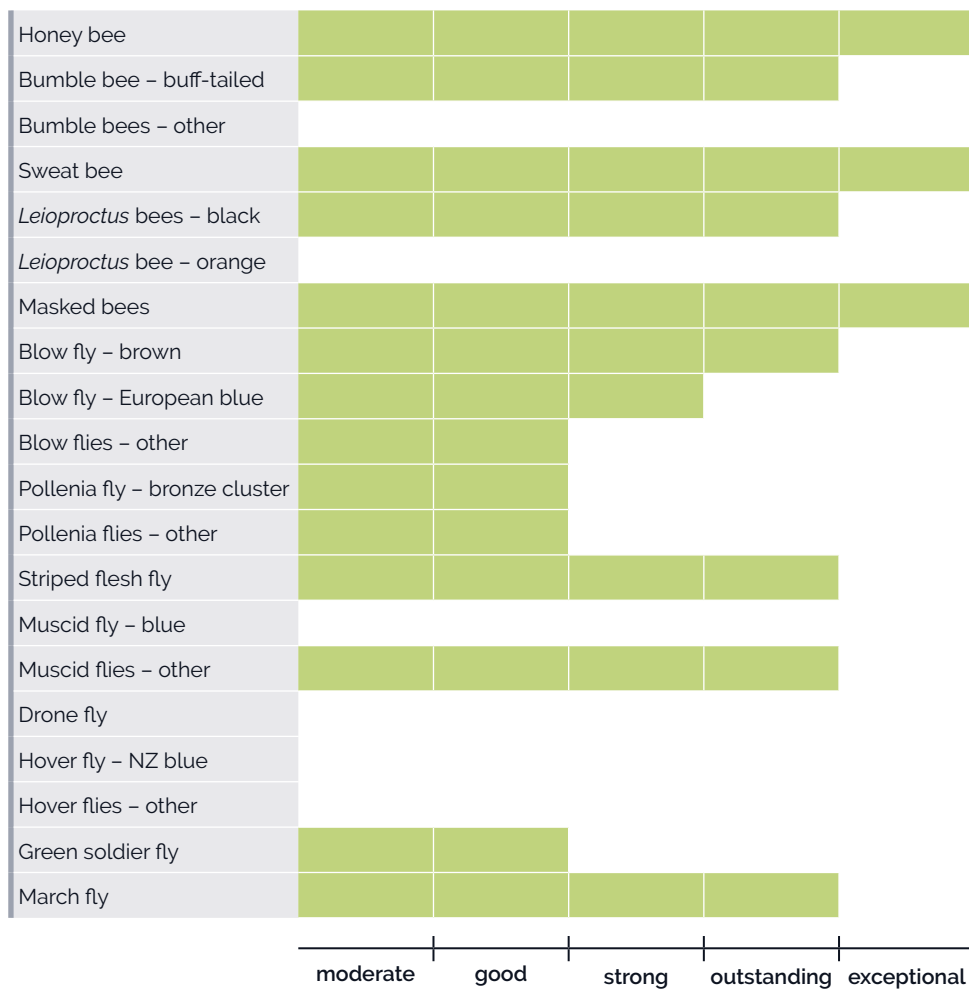
Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

Image credit: Dinkum, CCO, via Wikimedia Commons



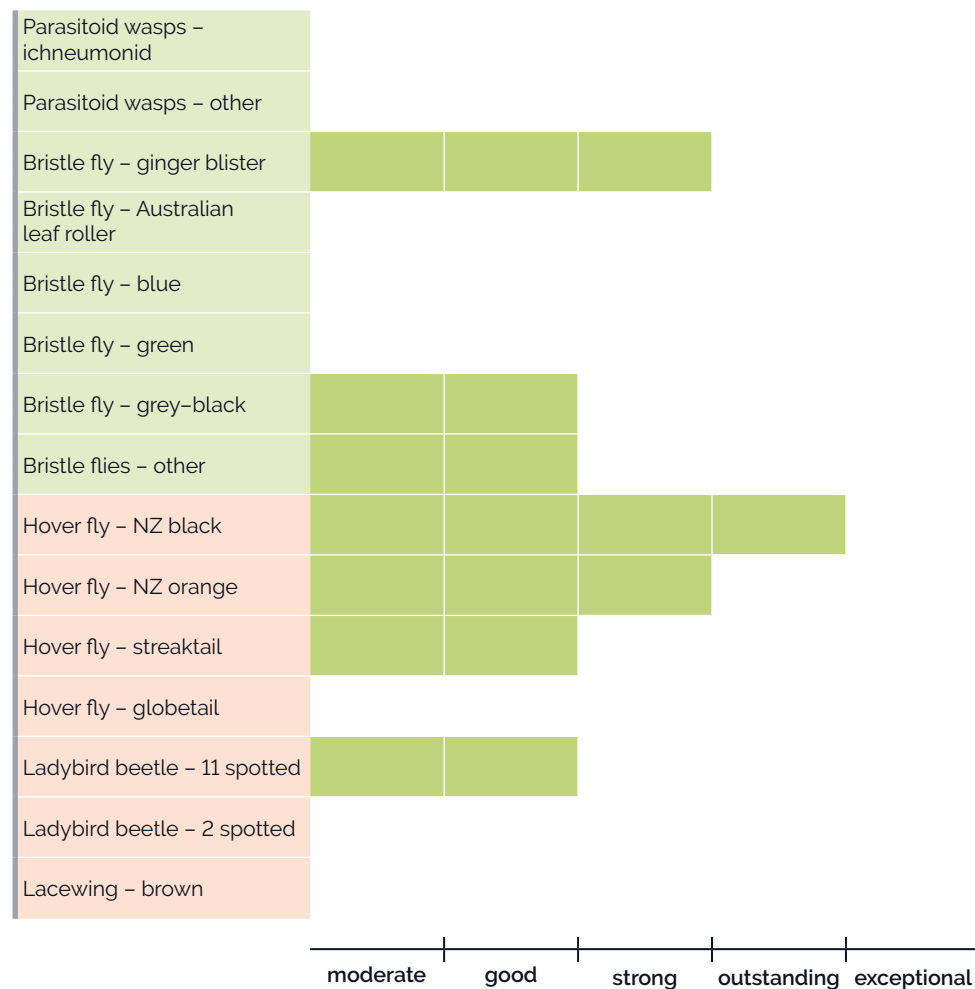
Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





17 Narrow-leaf Pomaderris/Tauhinu (*Pomaderris phyllicifolia*)

When tauhinu plants flower in late spring, they support beneficial insects including bristle flies and muscid flies. Four different insect species have been recorded visiting its cream to yellow-coloured flowers across Canterbury farmland including the broom seed beetle (*Bruchidius villosus*), a biological control agent for scotch broom.

Tauhinu is a small shrub with a medium growth rate, reaching 1.5m tall and 2m wide at maturity, making it suitable for planting under pivot irrigation systems. It prefers dry sites with full sun to partial shade and is frost tolerant.

Traditionally, Māori value tauhinu for its medicinal and practical uses. The leaves were used to make infusions for skin ailments, and the branches were used to make small tools or for fuel⁽⁴²⁾.

Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

Image credit: Jon Sullivan, CC BY 4.0, via Wikimedia Commons



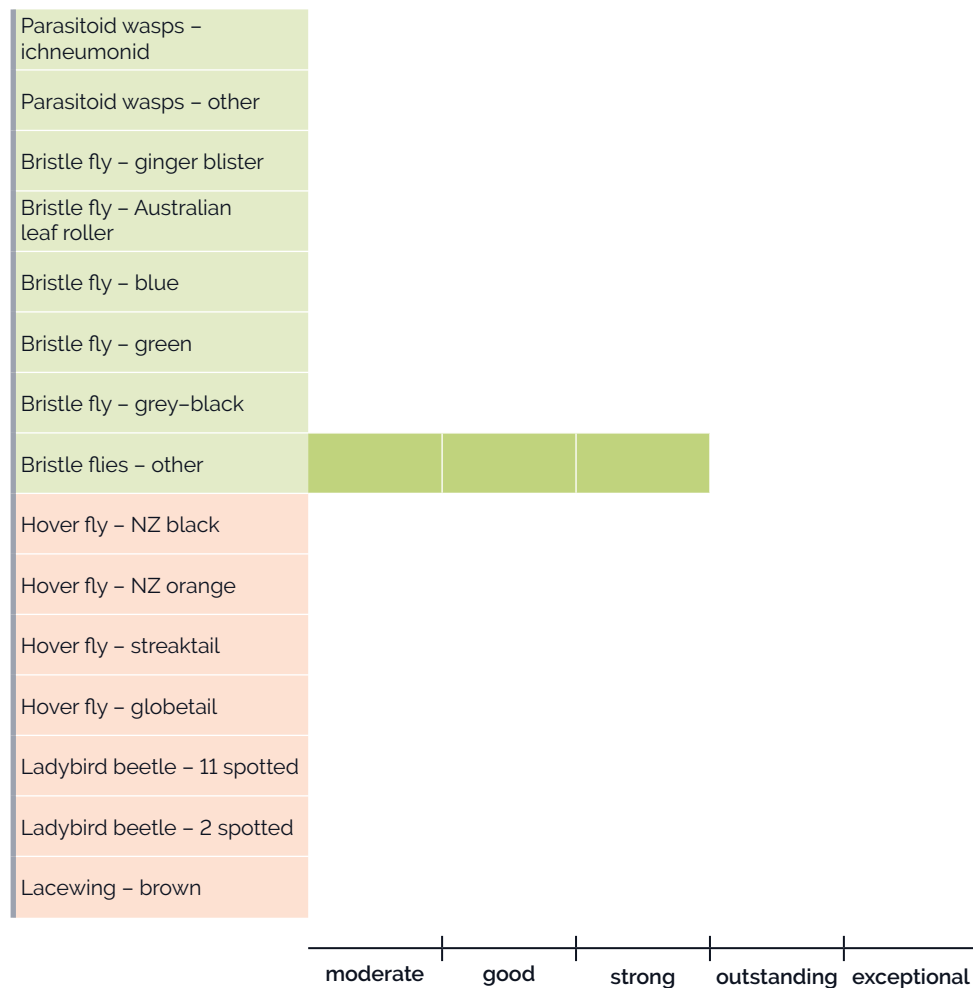
Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





18 Narrow-leaved lacebark/Houhi (*Hoheria angustifolia*)



When houhi flowers in summer, it plays an important role in supporting a large diversity of beneficial insects, including hover flies, bees, brown lacewings, and soldier flies. At least 43 different insect species have been recorded visiting the small white flowers of houhi across Canterbury farmland.

Houhi is a small, hardy tree with a medium growth rate, reaching 3m tall within 5 years and up to 6m tall and 3m wide at maturity. It prefers moist to dry sites, tolerates full sun to partial shade, and is frost tolerant.

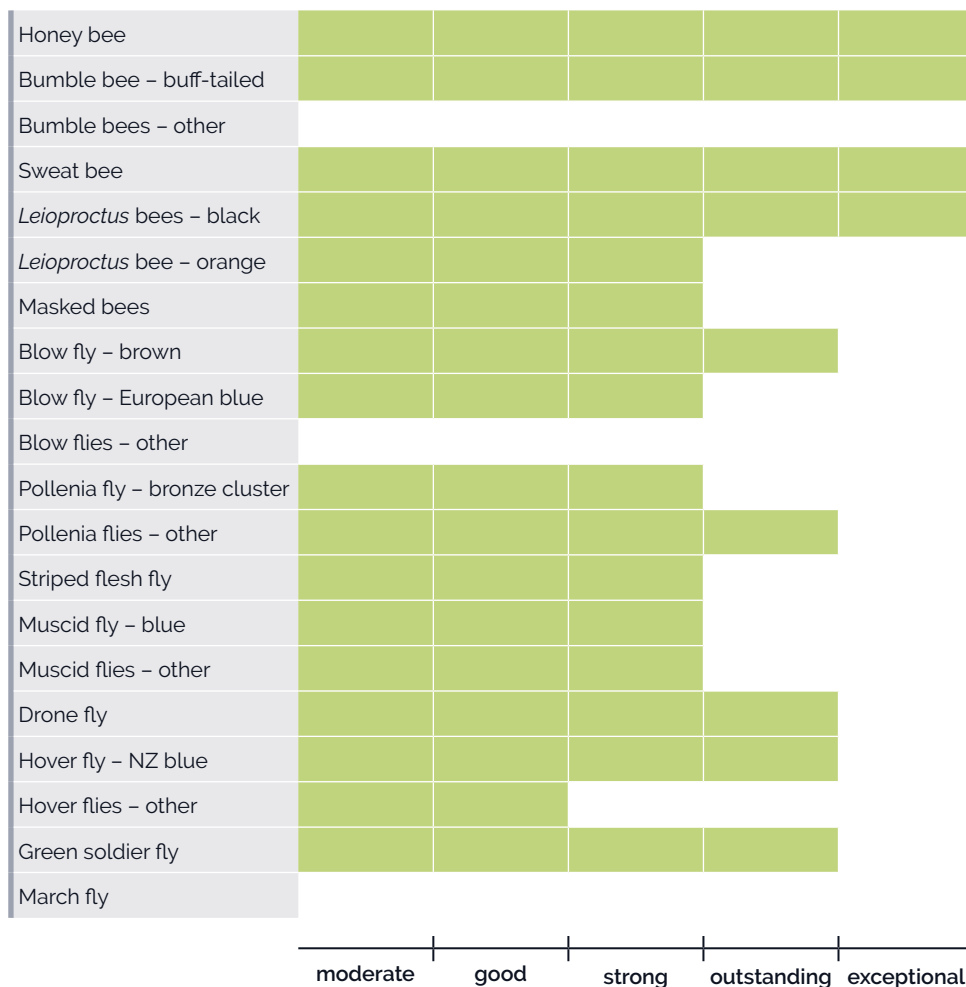
Traditionally, Māori value houhi for its strong and flexible fibres. The bark was used to make cordage, and it was also prepared as poultices to treat wounds⁽⁴²⁾.

Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug



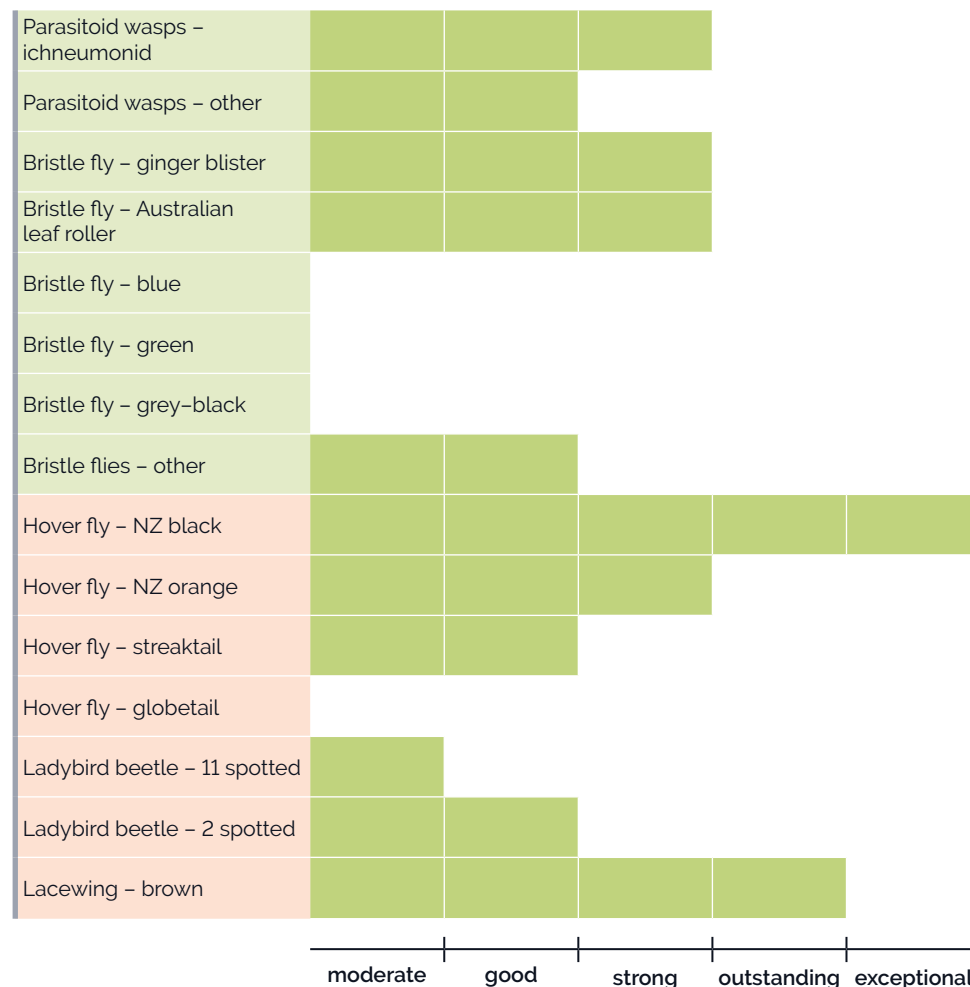
Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





19 NZ Broadleaf/Kāpuka (*Griselinia littoralis*)



When kāpuka plants flower in spring, they support populations of beneficials including parasitoid wasps, sweat bees, muscid flies and march flies. At least 11 different insect species have been recorded visiting the tiny pale green kāpuka flowers across Canterbury farmland.

Kāpuka is a large shrub with a medium growth rate, reaching 3m tall within 5 years and up to 6m tall and 2.5m wide at maturity. It grows well in moist to dry sites and prefers full sun to partial shade. This species is known for its hardiness, being tolerant to frost, drought and coastal conditions.

Traditionally, Māori value kāpuka for its medicinal and practical uses. Its sap was applied to treat various skin conditions, and its wood was used for making a variety of tools⁽⁴²⁾.

Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

Image credit: Krzysztof Ziarnek, Kenraiz, CC BY-SA 4.0, via Wikimedia Commons



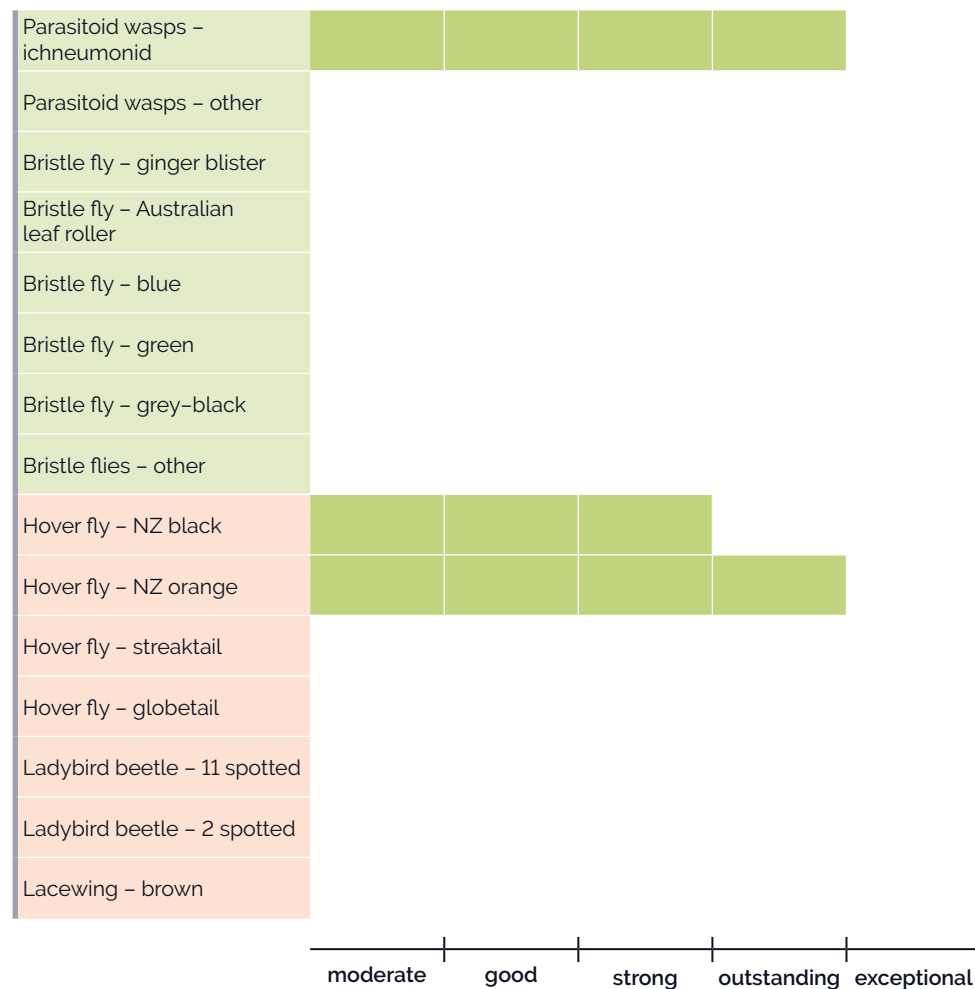
Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





20 NZ Broom/Mākaka (*Carmichaelia australis*)

When mākaka plants flower in late spring, they are a champion for supporting populations of beneficials including bees, muscid flies, march flies and soldier flies. At least 31 different insect species have been recorded visiting the pea-shaped mākaka flowers across Canterbury farmland. These include native bees that also visit white clover.

Mākaka is a small shrub with a medium growth rate, reaching 2m tall within 5 years and up to 3m tall and 2m wide at maturity. It prefers moist to dry sites, grows best in full sun, and is frost tolerant.

Traditionally, Māori value mākaka for its practical and medicinal uses. Bark infusions were used to help relieve fever and pain, and it's tough, flexible stems were used for weaving and lashings in construction⁽⁴²⁾.

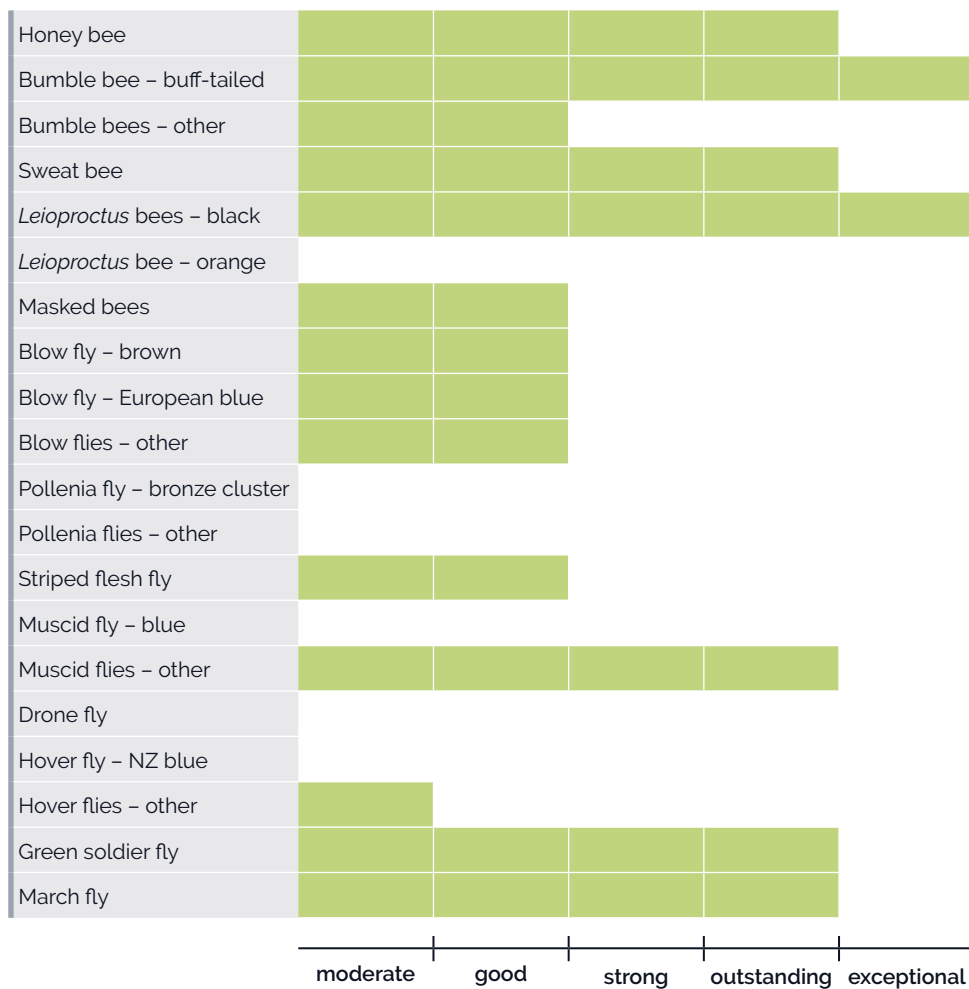
Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

Image credit: Christopher Stephens, CC BY-SA 4.0, via Wikimedia Commons



Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





21 NZ Myrtle/Rōhutu (*Lophomyrtus obcordata*)



When rōhutu plants flower in late spring to early summer, they support a diverse range of beneficials including hover flies, bees, bristle flies and soldier flies. At least 26 different insect species have been recorded visiting the cream-coloured flowers of rōhutu across Canterbury farmland.

Rōhutu is a small shrub with a moderate growth rate, reaching up to 2m tall and 2m wide at maturity, making it suitable for planting under pivot irrigation systems. It grows well in dry to moist sites, with full sun to partial shade and is frost tolerant.

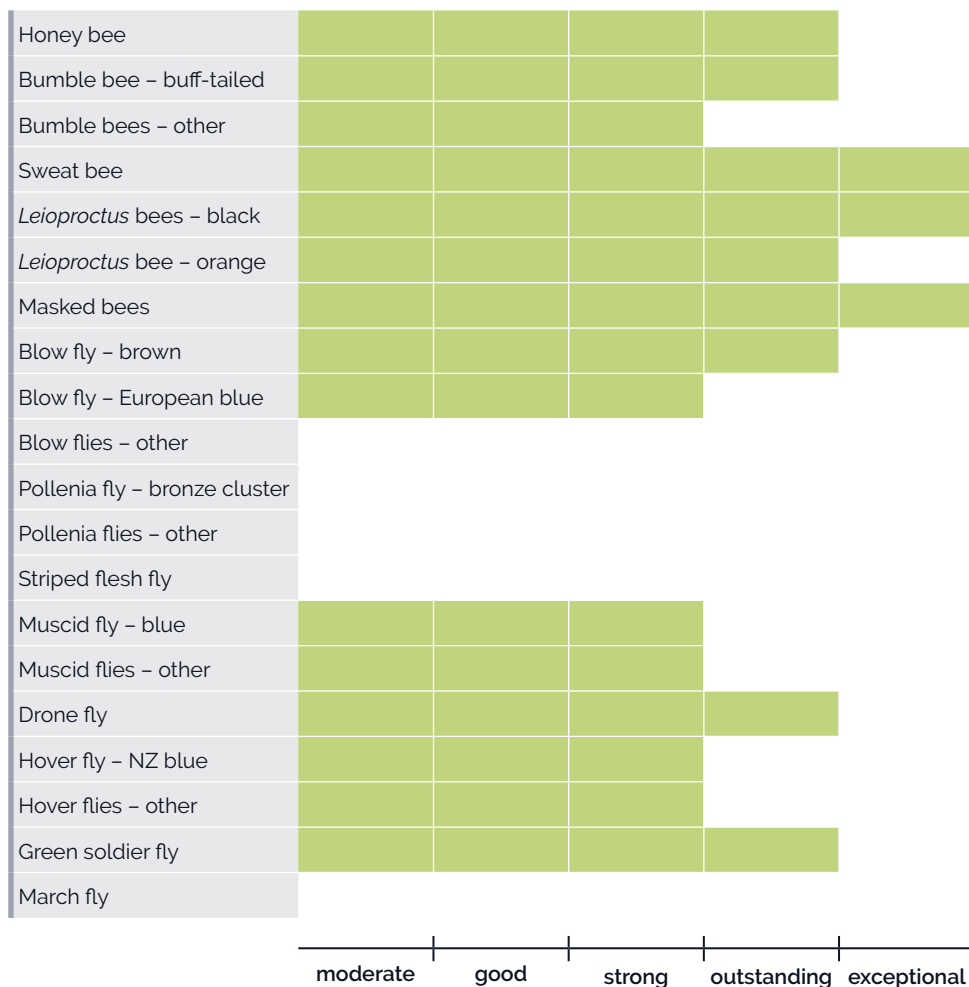
Traditionally, Māori value rōhutu for its pleasant fragrance and medicinal uses. The leaves were used to make aromatic oils for perfume, and the bark was boiled to treat fevers⁽⁴³⁾.

Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug



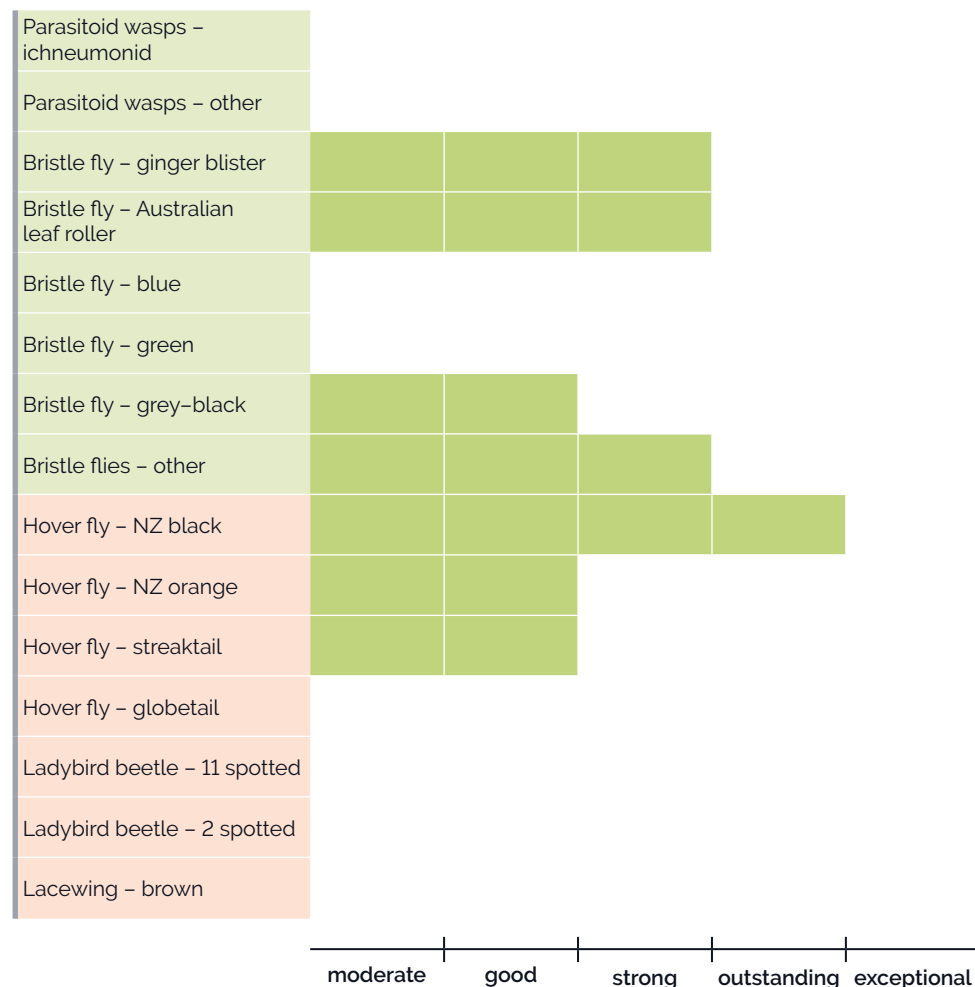
Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





22 Shrubby tororaro/Tororaro (*Muehlenbeckia astonii*)

Flowering in early autumn, tororaro plants support a wide range of beneficial insects, including hover flies, sweat bees, Pollenia flies, and brown lacewings. At least 35 species have been recorded visiting its small white flowers across Canterbury farmland.

Tororaro is a divaricating shrub with a moderate growth rate, reaching 2m tall and 1.5m wide at maturity, making it suitable for planting under pivot irrigation systems. It grows well in dry to moist sites, with full sun to partial shade and is frost and coastal tolerant.

Traditionally, Māori value tororaro for both its ecological significance and practical uses. It served as an indicator of high-altitude environmental conditions and seasonal changes within alpine and mountain plant communities. In addition, it was used as a building material in the construction of houses⁽⁴⁶⁾.

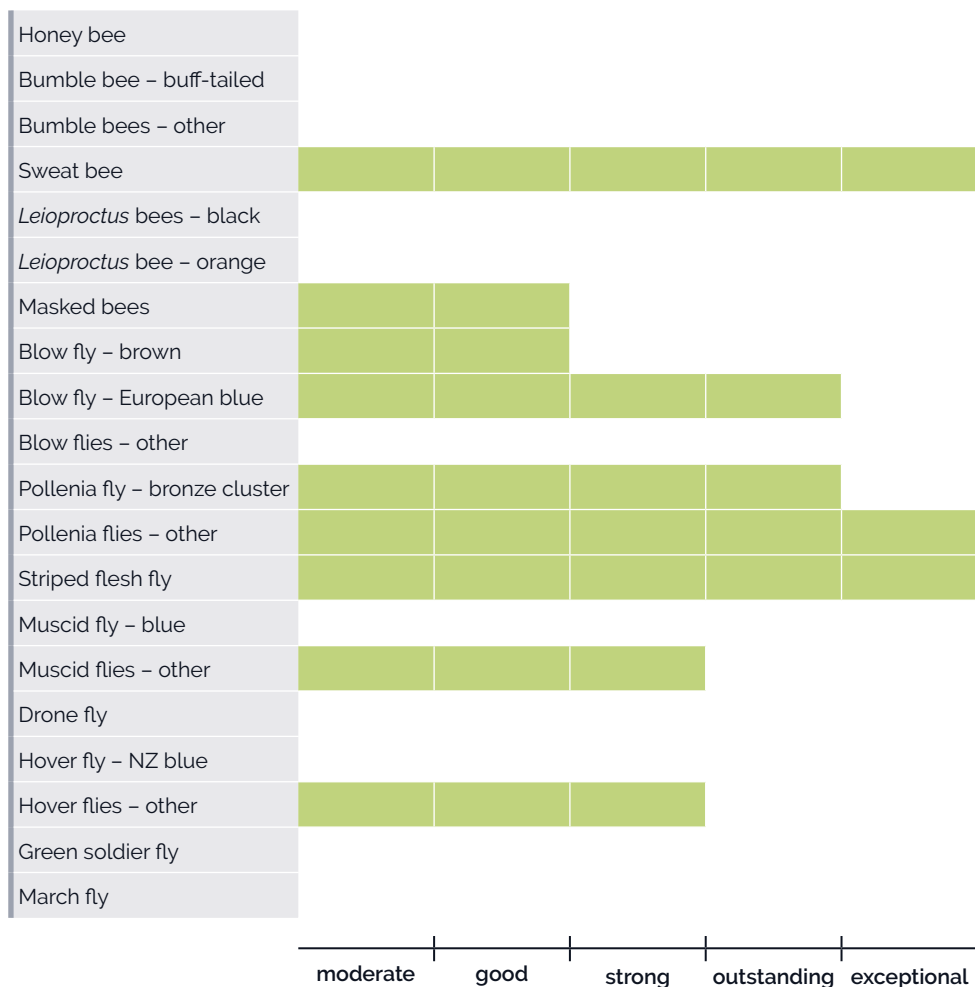
Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

Image credit: John Pons, CC BY-SA 4.0, via Wikimedia Commons



Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





23 *Teucrium parvifolium*



Flowering from mid spring to midsummer, *T. parvifolium* supports a range of beneficial insects, including hover flies, bees, soldier flies, and march flies. At least 40 insect species have been recorded visiting its small, white flowers across Canterbury farmland.

T. parvifolium is a fast-growing, compact small shrub, reaching up to 2m tall and 1 metre wide at maturity, making it suitable for planting under pivot irrigation systems. It tolerates poor, dry sites, is frost tolerant, and grows well in full sun to partial shade.

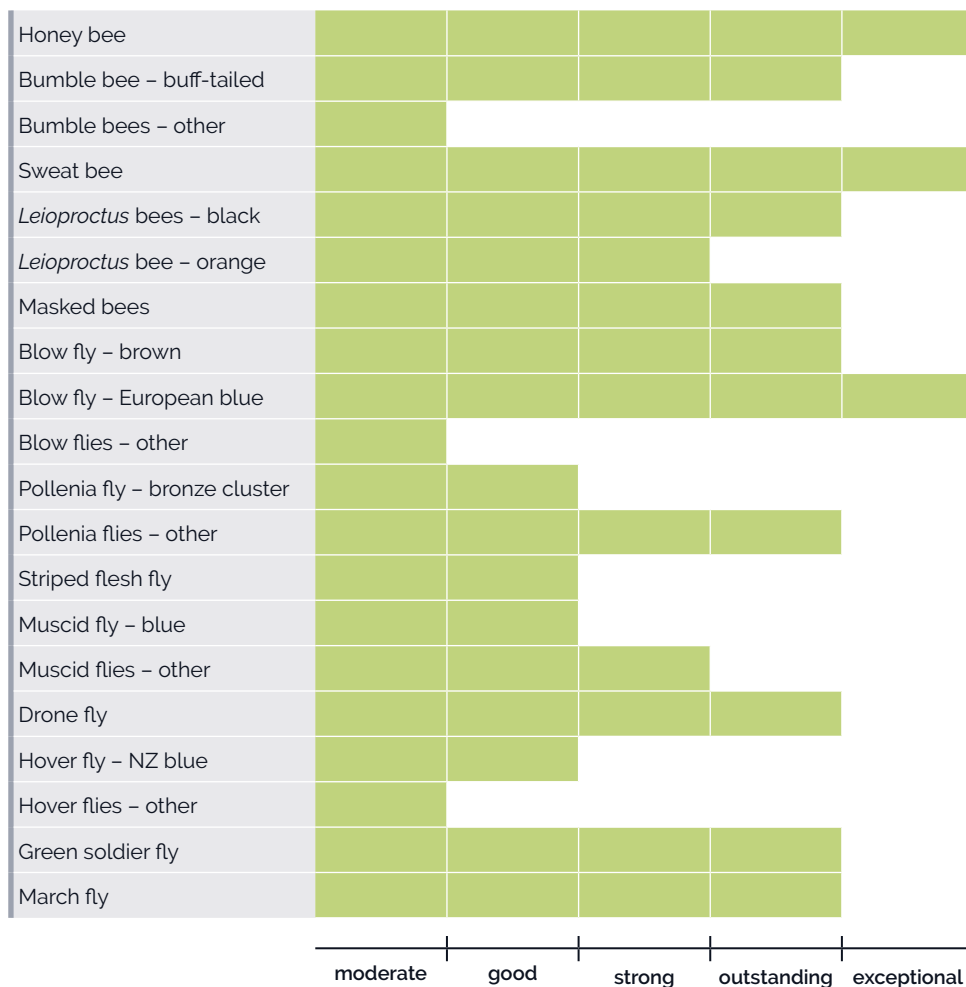
Traditionally, Māori value *T. parvifolium* for its medicinal uses. The leaves were used to treat various stomach ailments and as general health tonics⁽⁴²⁾.

Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug



Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





24 Weeping kōwhai/Kōwhai (*Sophora microphylla*)

When kōwhai plants flower in spring, they support populations of beneficials including hover flies, bees and muscid flies. Despite the flowers being tubular, which may restrict access to nectar and pollen for some insects, at least nine different insect species have been recorded visiting its yellow flowers across Canterbury farmland.

Kōwhai is a small tree with a medium growth rate, reaching 3m tall within 5 years and up to 8m tall and 3m wide at maturity. It grows well in moist to dry sites, tolerates full sun to full shade, and is frost tolerant.

Traditionally, Māori value kōwhai for its medicinal, practical, and cultural uses. Bark infusions were prepared to help treat bruises and relieve pain, its wood was used for carving, and the flowering of kōwhai was an important indicator of seasonal change⁽⁴³⁾.

WARNING: Kōwhai (*Sophora* spp.) is toxic to grazing animals. All parts of the tree (leaves, bark, and flowers) are poisonous, particularly the ripe yellow seeds. Excessive consumption of kōwhai nectar by honey bees can cause narcosis or even death⁽⁴⁷⁾. To minimise this risk, avoid placing managed hives near flowering kōwhai. Toxic effects of kōwhai nectar or pollen on other flower-visiting insects remain unclear.

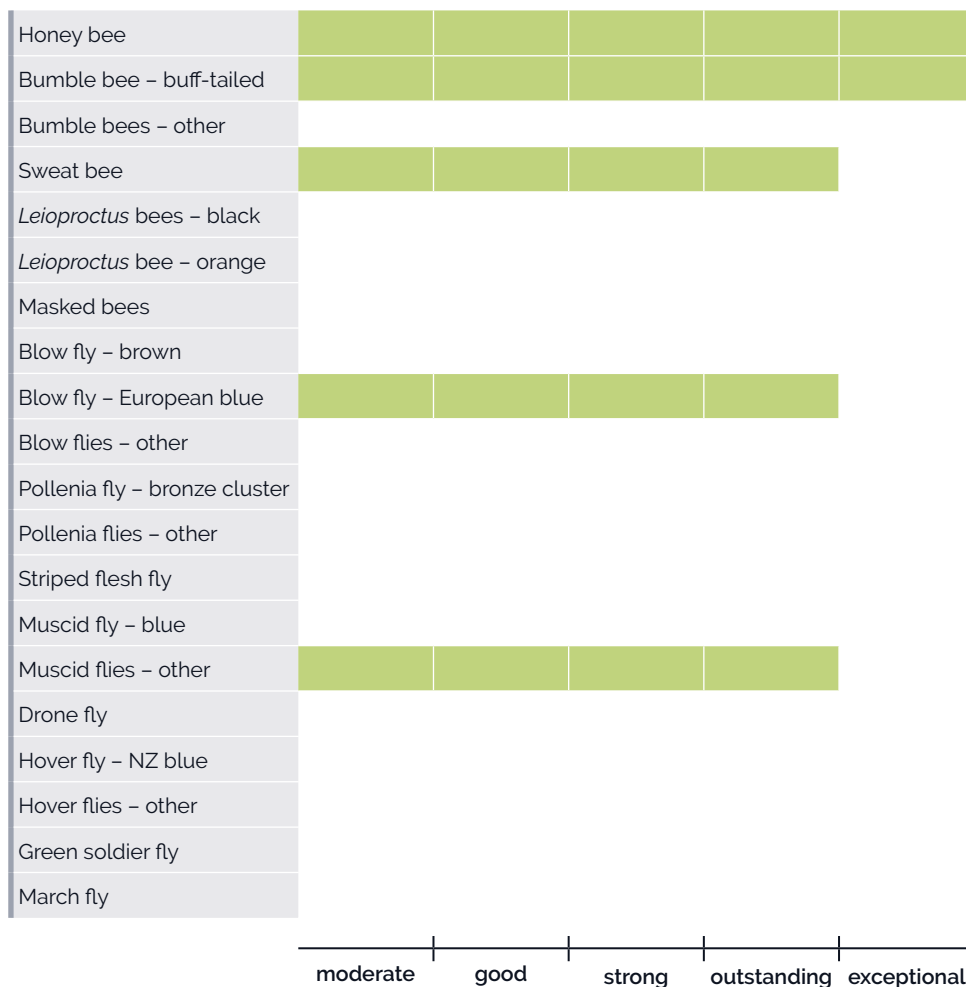
Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

Image credit: Karora, Public domain, via Wikimedia Commons



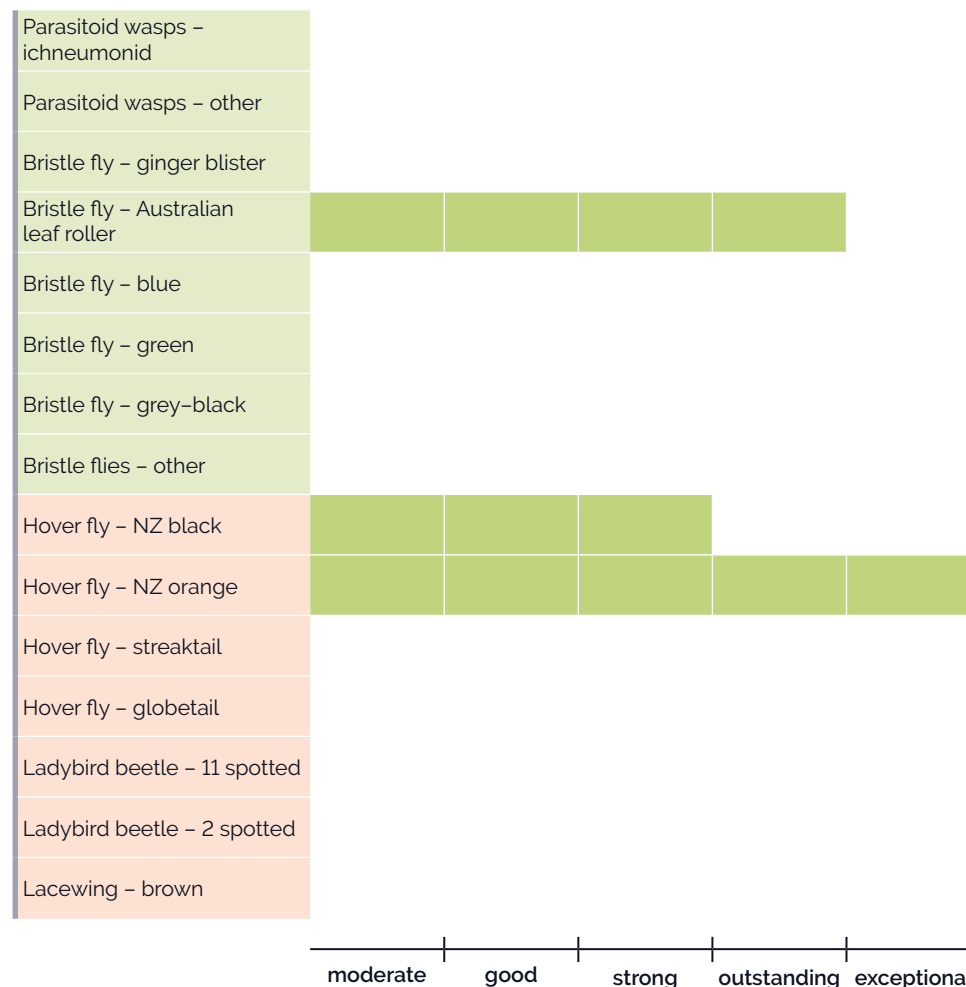
Pollinators



Pest exterminators

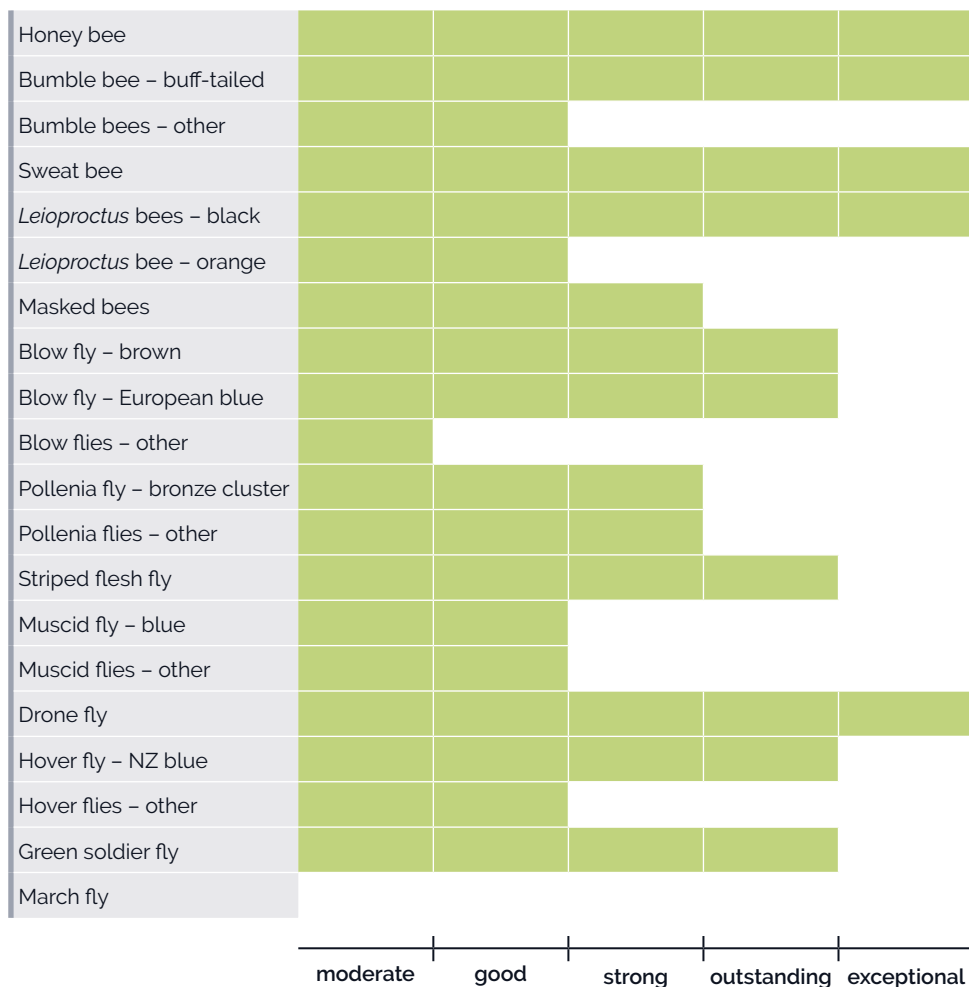
[Green square] = Parasitoids

[Orange square] = Predators





Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





26 Wire vine/Pōpōhue (*Muehlenbeckia complexa*)



When pōpōhue plants flower in summer, they support a wide range of beneficials including hover flies, bees, parasitoid wasps and pollenia flies. At least 23 different insect species have been recorded visiting pōpōhue's tiny creamy-green coloured flowers across Canterbury farmland.

Pōpōhue is a dense vine with a moderate growth rate, reaching up to 0.2m tall and 1 metre wide at maturity, making it suitable for planting under pivot irrigation systems. It grows well in moist to dry sites, tolerates full sun to full shade, and is frost tolerant. Pōpōhue is also wind and salt tolerant, and can withstand drought once fully established, making it suitable for coastal conditions.

Traditionally, Māori value pōpōhue for its practical and medicinal uses, the stems were used for lashings and fish traps, and the juice was applied to wounds⁽⁴³⁾.

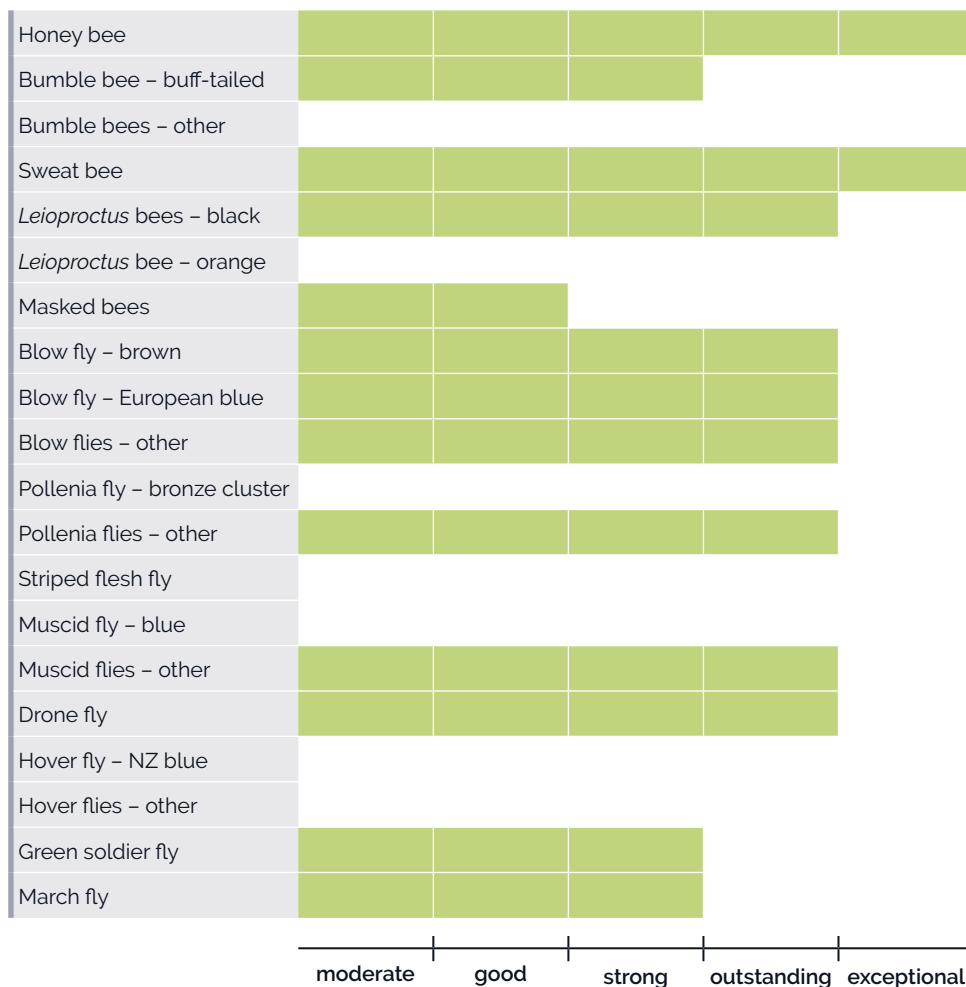
Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug

Image credit: Peter de Lange, CC0, via Wikimedia Commons



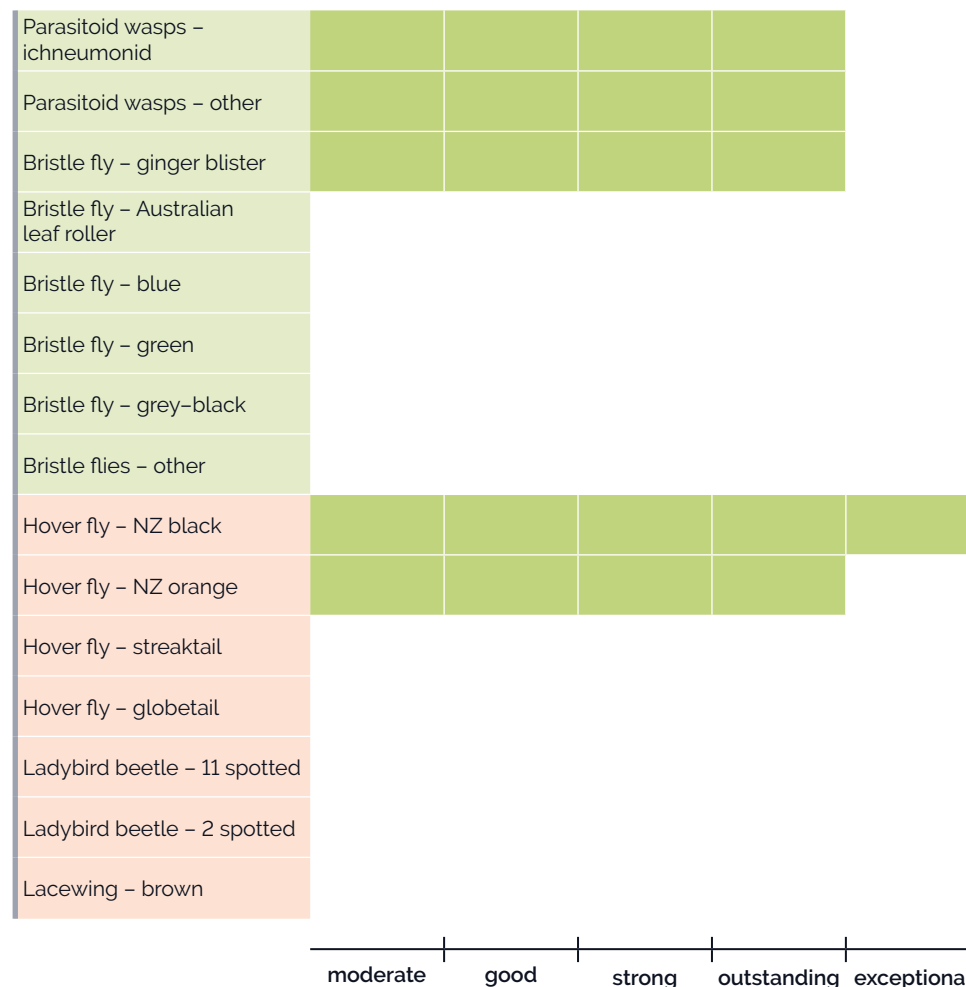
Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators





27 Wire-netting bush/Korokio (*Corokia cotoneaster*)



When korokio plants flower in spring, they play an important role in supporting populations of beneficials including hover flies, bees, muscid flies and blow flies. At least 28 different insect species have been recorded visiting the small bright yellow flowers of korokio across Canterbury farmland.

Korokio is a hardy, divaricating shrub with a medium growth rate, reaching 2m tall within 5 years and up to 3m tall and 2m wide at maturity. It grows well in moist to dry sites, prefers full sun to partial shade, and is very tolerant of frost, drought and wind.

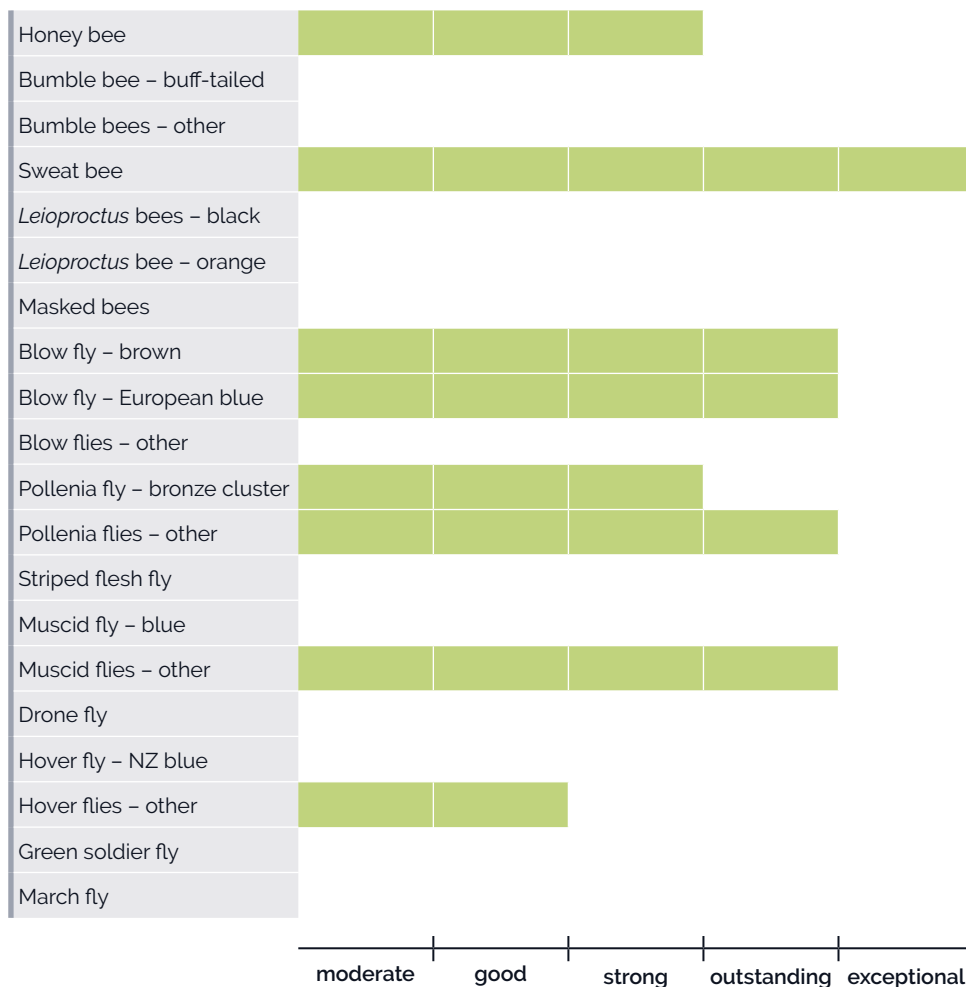
Traditionally, Māori value korokio for its medicinal uses, particularly its leaves, which were boiled and used to provide instant relief for stomach aches⁽⁴⁸⁾.

Flowering season

Spring			Summer			Autumn			Winter		
Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug



Pollinators



Pest exterminators

■ = Parasitoids

■ = Predators



Section 6 –

Canterbury farmer insights: planting natives for beneficial insects





Native planting: Taking a practical step

Across Canterbury, farmers are taking a practical, step-by-step approach to planting natives to support beneficial insects. Rather than large, one-off projects, many start small in areas that are harder to farm, such as waterways, fence lines, corners, or wet patches. They then expand over time as they gain confidence and see results.

While beneficial insects are a clear driver, they are rarely the only reason for planting. Farmers tend to see native planting as delivering multiple benefits at once, including improved aesthetics, biodiversity, shelter, and waterway protection, making it easier to justify within the farm system.

There is a strong sense of ownership and hands-on involvement, with many planting and maintenance carried out by farmers themselves, often supported by family, community networks, or targeted expert advice. This reflects a preference for approaches that can be integrated into existing farm operations and managed over time.

Experiences from the case studies show that while establishment can be challenging, particularly around weed control, cost, and early maintenance, farmers who persist begin to see tangible benefits. These include increased presence of beneficial insects, reduced reliance on insecticides, and greater confidence in integrated pest management approaches.

Overall, native planting is viewed not as a standalone activity, but as part of a broader shift toward more resilient, lower-input farming systems, where supporting beneficial insects plays a practical role alongside wider environmental and farm management goals.



Farmer survey: A Canterbury snapshot

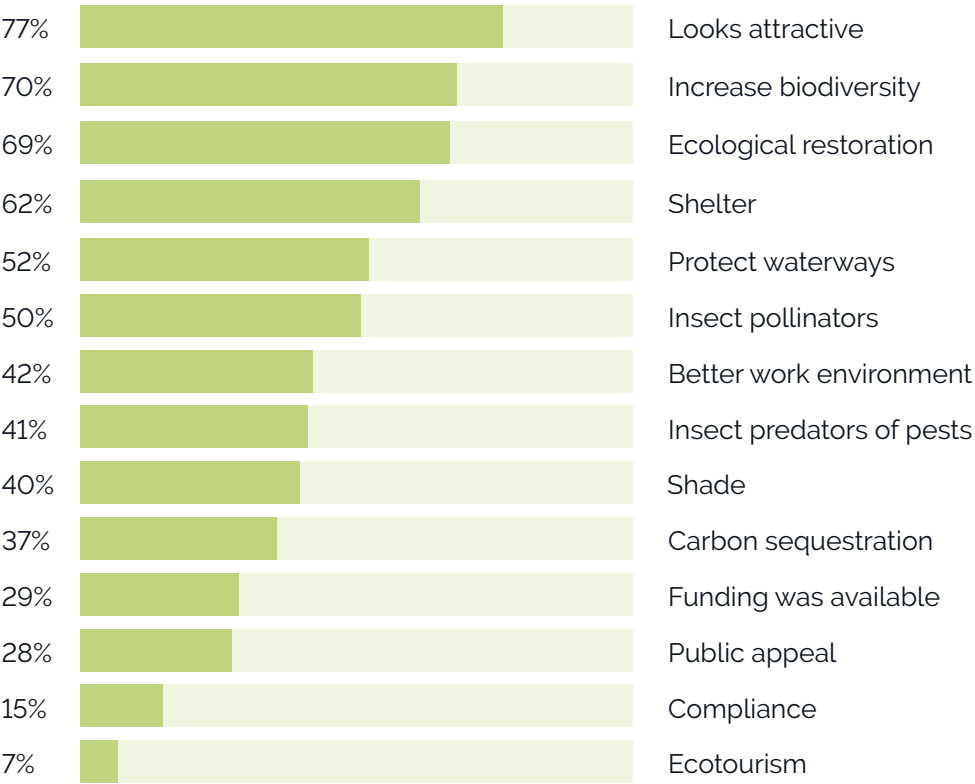
Across Canterbury, farmers and rural landholders are taking a range of approaches to native planting, shaped by their farm needs and values.

To understand what's happening on farm, we surveyed 107 Canterbury farmers and rural landholders who have planted native plants on their properties. We asked what motivated them to get started, how they approached planting and whether they plan to keep planting in the future.

Every farm is different, so there's no single right way to do it. Use these results as a practical reference point and idea-starter. They can help you compare your approach with what others have done, choose a manageable place to start, and think through who will do the planting and ongoing maintenance.

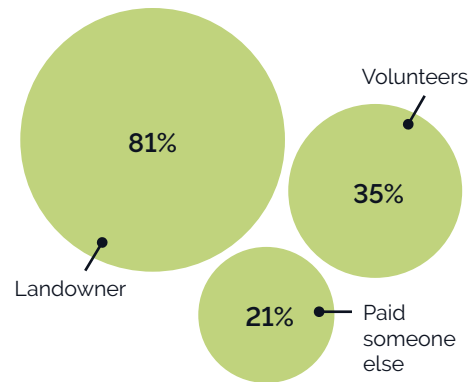
What motivates landholders to plant natives?

The **most common** motivations respondents gave for planting natives were to make the property more **attractive**, increased **biodiversity**, ecological **restoration**, **shelter**, and to **protect waterways**, with each selected by more than half of respondents.



NOTE: This question allowed for multiple responses, so totals exceed 100%.

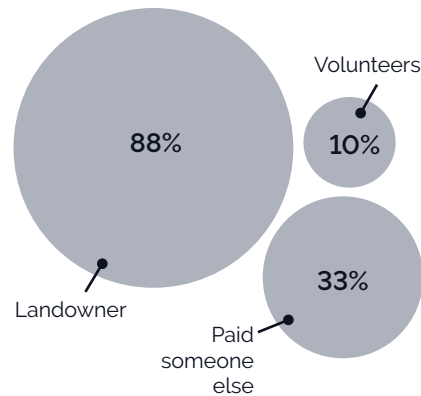
Who does the planting?



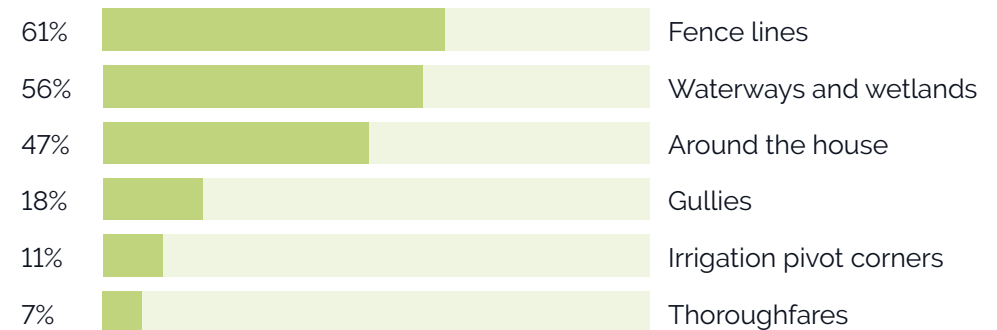
NOTE: This question allowed for multiple responses, so totals exceed 100%.

Most landowners, along with their family and friends, **plant and maintain** their native plantings themselves. Volunteers are used more for initial planting rather than ongoing maintenance. Only 10% of landowners paid for initial planting support, whereas around a third pay for maintenance services.

Who maintains the planting?



Where do landholders plant natives?

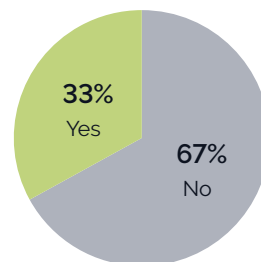


NOTE: This question allowed for multiple responses, so totals exceed 100%.

Native planting was **most common** along **fence lines (61%)** and around **waterways and wetlands (56%)**. Around the house was also a relatively common planting location, selected by 47% of respondents. Smaller proportions reported planting in gullies (18%), irrigation pivot corners (11%), and thoroughfares (7%).

Did landholders already have native plants on their properties before they began planting?

67% of landowners surveyed **did not have native plants** on their property before they began planting.



What is the average number of plants planted?

The scale of plantings ranged from the smallest of 15 plants, up to larger scale initiatives of 20,000 plants with an average around **3200**. The **majority** of landowners surveyed had **planted 1000 plants or less**.



How many different species are planted?

Of the respondents who had planted natives on their site, the **largest proportion (41%)** opted to plant between **6–10 different species**. Only 16% of landowners planted fewer than 5 species. A still considerable proportion (27% and 16% consecutively) planted between 11–20, and 20+ species.



How many landholders have plans to continue planting?

54% of the landowners surveyed said that they **plan to plant more** natives in the future.





Farmer interviews: Local Canterbury case studies

The following case studies show a range of planting approaches across different farm types, planting locations, and goals. In each example, beneficial insects are an important focus, alongside a wider set of farm and environmental priorities.

The case studies are based on semi-structured interviews carried out in 2025–26 with Canterbury farmers. Participants were identified through a range of sources and selected because they could share hands-on experience of planting and maintaining native plants on farm, with relevance to beneficial insects.

These case studies are intended to help farmers learn from what others have already done by sharing what they tried, what worked well, what challenges came up, and what benefits they observed over time. They show practical ways native plantings can fit within a range of farm priorities. Our hope is they provide a source of inspiration for those considering native plantings.

Case study: Native planting around arable land



Canterbury farmer & native forester,
John Evans.

Farm profile

Location	Ashburton, Canterbury
Farm type	Mixed arable
Farm size	271 hectares

Motivation for planting natives

John began planting after taking part in a Trees for Bees programme, starting on the margin of an irrigation pond because it was difficult to crop and manage. The initial planting focused on plants attractive to honey bees. The following year he planted the other half of the pond's edge with native species selected to support a wider range of beneficial insects, then continued adding small plantings in difficult-to-manage areas so they linked up across the farm. The aim was to create connected habitats and floral resources for beneficial insects and support pest control in the cropping system.

Native planting profile

Native planting area	2.5 ha
Native planting began	2011
Native planting location(s)	Started around an irrigation pond margin, then distributed across difficult-to-manage areas (corners, edges, wet patches, shelter belts) to form linked habitats
Native planting approach	Started small and expanded over time

What worked well

- Accessing expert advice early to select plants associated with beneficial insects
- Using sleeves so herbicide could be used around seedlings for early weed control
- Using trickle irrigation at the pond site for the first 2 years to help plant establishment.

What we learned along the way

- Weed control is the biggest challenge early on; grass competition can quickly dry out and outcompete young plants
- There is a "messy middle" before canopy closure when weeds persist but spraying becomes more complicated.

“You've got to get used to weeds until the canopy closes over...there is an end, it does work.”

Cost

At the time, John estimated costs at about \$8 per plant once the plant, planting, and plastic protector were included. The first year was supported through research funding (planting funded, maintenance covered by the farm), and he later used Ballance Environmental Awards prize money to support establishment inputs. He notes labour is the biggest cost driver as scale increases.

Observed benefits

- Less reliance on broad-spectrum insecticides, with more confidence to use integrated pest management (IPM) approaches
- Aphid control felt easier when habitats for beneficial insects was available across the farm
- A native copper butterfly appeared before John retired and sold the farm, suggesting native insects were returning.

“We made an environment where the native insects were actually coming back... we've restored the ecosystem... a little bit to what it was.”

Advice for other farmers

- Consider placing the initial planting next to the house so you can keep an eye on it and learn before you scale up
- Start small and build over time, planting awkward corners, wet patches, and edges and linking areas gradually rather than trying to do big blocks
- Expect weeds until canopy closure and plan for that phase so you do not lose momentum.



Two-stage pond planting layout. Honey bee-focused species planted along the top and right margins; the second stage beneficial-insects focused species planted on the left margin and near the beehives.



One year after planting, early establishment on a dryland native planting block, with a diverse mix of species protected with sleeves.

Case study: Native planting around wetland



LeaderBrand South Island general manager
Mike Arnold

Farm profile

Location	Chertsey Canterbury
Farm type	Vegetables: asparagus, broccoli, beetroot
Farm size	400ha

Motivation for planting natives

The planting at LeaderBrand's Chertsey farm began through a collaboration between General Manager Mike Arnold and Bioeconomy Science Institute scientists who were seeking a research site. Mike's motivation was integrated pest management and "doing things with less inputs", with natives seen as a practical way to build on-farm habitats for beneficial insects. Mike has seen benefits beyond production; the planting is a place staff enjoy working in, supports the business' sustainability story with customers, and aligns with audit requirements including New Zealand Good Agricultural Practices (NZGAP), that encourage improving biodiversity and converting unproductive areas. Mike sees real on-farm value in natives and would like to see more planting across Chertsey and beyond.

Native planting profile

Native planting area	4 ha
Native planting began	2015
Native planting location(s)	A former lucerne block bordered by farm access tracks and cropping land, with a wetland in the southeast corner
Native planting approach	Two block plantings

What worked well

- Using a local restoration expert early on to help with species selection and establishment
- Treating establishment as a full system, with good site preparation, tight weed control, plant protection, and reliable water. This resulted in 95% survival rate and rapid growth
- Expanding the planting in increments after seeing benefits.

What we learned along the way

- Widening plant spacing so a small cart could access the rows made weed control more practical than relying on knapsack work
- Costs scale fast, so looking for ways to reduce establishment costs can help, including options like buying plants direct and exploring seed collection and growing plants in-house.

Cost

The planting has required a significant investment. Total costs are around \$100,000 with major cost drivers including labour, contract support, plant guards/mats, and getting water to the dryland site. Carbon credits are being explored as one way to help offset costs where the planting meets eligibility criteria.

Observed benefits

- High abundance and diversity of pollinators and natural enemies in the planting
- A diverse mix of native species means there is usually something flowering in most months, providing year-round floral resources for insects
- From an IPM perspective, spray use is lower
- The planting provides a valued space for visitors and farmworkers.

“The comments you get from people you take out [to the planting] are so positive.”

“What I do know is with our IPM and monitoring, we do spray less because we do look after the beneficial [insects].”



Advice for other farmers

- Get expert advice early and be organised. Plan the site, species, access, and weed management plan before plants go in
- Think beyond your farm gate. Connected plantings can create wider regional corridors for beneficial insects and native wildlife.

Case study: Native planting around dairy



Liz and Alastair Frizzell.

Farm profile

Location	Kirwee, Canterbury
Farm type	Leased to a dairy operator, previously farmed by Liz and Alastair as mixed sheep and arable
Farm size	140 ha

Native planting profile

Native planting area	~5 ha
Native planting began	2016
Native planting location(s)	Marginal farmland, water-race strip, roadside
Native planting approach	Plantings slowly expanded over time

Motivation for planting natives

Planting began after a strip of pine trees was harvested; the area was narrow, roadside, and increasingly impractical to manage economically as forestry. Instead of replanting pine, the Frizzells decided to use the strip for their first native planting, aiming "to benefit the environment and create something people could enjoy". Liz led the planting and maintenance and when choosing what to plant, her initial goal was to provide habitat and food resources for birds, bees, lizards, and skinks. Supporting beneficial insects was part of the wider ethos, influenced by her previous experience as an organic grower. Liz now monitors beneficial insects in the planting using window intercept traps. Liz also sees the ongoing hands-on work as a positive, helping her stay fit and active.

What worked well

- Building relationships with nurseries and community contacts allowed Liz to source plants from a wide network, including donated plants
- Access to a solar pump and water from a race made it possible to irrigate during dry periods, supporting plant establishment
- Fully clearing the ground up-front made planting and maintenance easier
- Some species, like cabbage trees, were hard to source at times, so leaving gaps and infilling later helped.

What we learned along the way

- Don't rush removing plant guards; "removing them at 18 months as advised was a disaster". Liz now leaves them on until the plants outgrow them
- Persistent wind limited spraying windows, sometimes forcing weed-eating instead
- Early blocks became largely self-sustaining after 3 years, but the first 3 years required a lot of maintenance.

Cost

Planting natives can be expensive, particularly once ongoing maintenance is factored in. Liz keeps plant costs down by aiming to spend no more than \$3.50 per plant, but still estimates she spends up to \$2000 per year on plants. She has made planting more affordable by drawing on small funding opportunities early on and using community-sourced plants including donations.

Observed benefits

- Being roadside and visible, the planting has increased community awareness of what's possible in Canterbury and helped demonstrate what can be grown locally.

■ [The planting] is very visible... it's right beside the road, and there's no fences, so you could just walk off the road and walk through it. I would like people to be able to do that."

Advice for other farmers

- Prioritise water in the first summer if you can
- Using a plant guard and mat system is critical for reducing wind stress and helping young plants establish
- Look into available grants to help with costs.



Roadside native planting established after a strip of pine was harvested.



Roadside planting with plant guards left on until plants were well established and outgrew the guards.

Case study: Native planting for riparian restoration



Carey Barnett farms in a family partnership in Ellesmere, Canterbury, integrating riparian restoration into a mixed arable and sheep system.

Farm profile

Location	Ellesmere, Canterbury
Farm type	Mixed arable and sheep
Farm size	~274 ha owned + ~45 ha leased

Motivation for planting natives

The Barnetts first started planting to care for and protect Harts Creek, a waterway they value highly. At the time, nearby neighbours were restoring waterways, and the Barnetts liked what they saw and decided to begin restoring their own waterway margins. A local stream care group provided a practical, farmer-led way to start, including peer support and access to funding opportunities that helped them keep planting over time. For Carey, this approach felt positive because it was driven by farmers rather than imposed by legislation, and those early relationships later grew into wider catchment work through the Ellesmere area.

What worked well

- Joining a catchment/stream care group for momentum, practical support, and shared learning
- Using funding programmes to scale up planting without carrying the full cost
- Paying for early maintenance when needed, then doing on-going upkeep in-house
- Using low shrub natives in pivot corners where tall trees are not practical.

What we learned along the way

- Early weed maintenance is critical, weeds can get out of hand quickly
- Good up-front planning and guidance on what to plant, where, and why makes it far more likely the planting will meet your goals.

“Don't just think about the planting. Think about the maintenance. The maintenance is probably the most important factor. You can do a whole heap of planting, but if you don't maintain it, you've wasted all the effort you put in.”

Native planting profile

Native planting area	~2 ha on owned farm + ~5 ha on leased blocks
Native planting began	2003
Native planting location(s)	Mostly riparian; some fencelines, ephemeral drains, and low shrubs under irrigation pivots
Native planting approach	Started small and expanded over time

Cost

Planting can be quite expensive, particularly if you try to do a large area at once. The Barnett's plantings have been made more achievable through access to funding streams linked to long-standing relationships with Environment Canterbury and the Selwyn District Council. The programmes typically involved shared costs and were supported by an associated maintenance plan.

Observed benefits

- The plantings have attracted beneficial insects which have helped keep aphids in check
- Less spraying is needed, with fewer passes across paddocks with the sprayer
- The planting has been a helpful buffer alongside an organic neighbour, reducing pressure at the organic-conventional boundary.

“**The native planting does attract the good bugs, which is really helpful in an arable system. The good bugs help limit aphids in our crops...we don't have to spray as much.**”

Advice for other farmers

- Be clear on your reason for planting first, then choose species and layouts that deliver that outcome
- Funding can make planting achievable at scale but choose a programme that fits your farm and that you can meet the reporting and maintenance requirements for
- Start at a manageable scale, then expand as you are able
- Get involved in a catchment group and make time to engage.



Newly established native planting along Harts Creek, planted to restore the creek margin.



Harts Creek showing established riparian planting.

SECTION 7 –
**Our vision for
the future**



Across Canterbury, farmers are taking a practical, step-by-step approach to planting natives to support beneficial insects. Rather than large, one-off projects, most start small in areas that are harder to farm, such as waterways, fence lines, corners, or wet patches. They then expand over time as they gain confidence and see results.

While beneficial insects are a clear driver, they are rarely the only reason for planting. Farmers tend to see native planting as delivering multiple benefits at once, including improved aesthetics, biodiversity, shelter, and waterway protection, making it easier to justify within the farm system.

There is a strong sense of ownership and hands-on involvement, with most planting and maintenance carried out by farmers themselves, often supported by family, community networks, or targeted expert advice. This reflects a preference for approaches that can be integrated into existing farm operations and managed over time.

Experiences from the case studies show that while establishment can be challenging, particularly around weed control, cost, and early maintenance, farmers who persist begin to see tangible benefits. These include increased presence of beneficial insects, reduced reliance on insecticides, and greater confidence in integrated pest management approaches.

Overall, native planting is viewed not as a standalone activity, but as part of a broader shift toward more resilient, lower-input farming systems, where supporting beneficial insects plays a practical role alongside wider environmental and farm management goals.

■ **I would like to think that in 10 years there will be enough native plantings spread across Canterbury, that there will be corridors to support the spread of the beneficial insect population and hence the whole native ecosystem.**

Farmers would be benefiting by having a pleasant working environment and less requirement to use harsh methods to control pests within their farms.

– John Evans, Canterbury farmer & native forester

■ **Widespread planting of native species across Canterbury has the potential to create healthier, more resilient farming systems that rely less on chemical inputs while remaining productive.**

This [..] project supports this shift by providing science backed guidance through the Whakapuāwai programme on the best native plant mixes to establish on farm.

By targeting plants that support key beneficial insects, farmers can strengthen natural pest control, pollination, and other vital ecosystem services delivering real environmental and production benefits.

– Sarah Mason, Synlait Milk Ltd.

■ **This project demonstrates that native biodiversity can be a valuable on farm asset and can help farmers improve environmental outcomes while remaining profitable and productive. Strategically establishing areas of native vegetation to encourage beneficial insects, including pollinators and pest controllers, helps enhance crop health and productivity. Integrating native biodiversity into farming systems has a range of benefits and can contribute to good outcomes for farmers, rural communities and the environment.**

– Tom Orchiston, Beef + Lamb New Zealand Ltd.

Indigenous biodiversity is critical to our lives - providing environmental resilience, economic opportunities and ecological services that cannot always be easily quantified, but that we know contribute to our well-being and identity.

This project has clearly shown that protecting and restoring indigenous biodiversity offers numerous benefits, and is an essential part of thriving productive landscapes.

My hope is that all landowners across Kā Pākihi Whakatekateka o Waitaha and Aotearoa work to protect and restore native vegetation on their land, and in turn reap the rewards of having thriving native insects, lizards, birds, and even fish, as normal and treasured parts of the landscape. So much so, that sustainable cultural and economic outcomes from these species can again be realised.

– Craig Pauling, Tairea Ltd / Ngāi Te Ruahikihiki

Native biodiversity plantings on farm make good sense. They provide shelter, reduce erosion, support social licence, and build resilience by encouraging beneficial insects; pollinators, predators, and parasitoids. They also enhance underused corners of the farm and improve overall appearance.

Guidance on what to plant, and when it flowers, is key to providing nectar through the season and bridging feed gaps for beneficial species. Nectar is critical, for example, parasitic wasps can control far more aphids when they have access to it rather than just water. This work is timely, as routine use of broad-spectrum insecticides as “cheap insurance” is falling out of favour due to their disruption of beneficial insects that naturally help manage pests and support pollination for free.

– Abie Horrocks, Foundation for Arable Research (FAR).

The Canterbury plains was once covered by diverse forests, and it is these forests that built up the soils we all farm today. Over time the humans that inhabited Canterbury cleared this native vegetation for their own purposes. When we put some of this native vegetation back, we provide habitats for the diverse and rich insect life that is still holding on in native remnants. This guide is an important piece of research that proves the value of native flowering plants and will contribute to improving the sustainability and function of our working farms.

– Stephen Brailsford, Brailsfords Ltd.

This guide represents a huge step forward in defining the ways in which indigenous insects can cross the boundaries between eco-system and production. I am optimistic that by supporting greater diversification and connectivity between eco-system and field, we can lower our inputs of chemical controls, increase the populations of invertebrates in our foodwebs and improve the resilience of production in a changing climate.

– Greg Stanley, Environment Canterbury Regional Council

Traditionally, Māori understood that every plant carried purpose, relationship, and responsibility. Reintroducing native species into Canterbury landscapes is not simply about planting trees, it is about restoring whakapapa connections between whenua, wai, insects, birds, and people.

Native plantings therefore have the potential to become more than isolated pockets of biodiversity. Over time, they can form living corridors of resilience, supporting beneficial insects, strengthening ecosystems, and reminding us that productive landscapes and thriving indigenous environments can exist side by side.

– Huata Arahanga, Tāpokotea

My hope for the future is that more farmers and landowners in Canterbury come to see native planting as a way to put their values of stewardship and care for the land into practice. Over time, this will help shape a Canterbury landscape that reflects both highly productive agriculture and the wider social and environmental benefits that native plantings bring.

– Crystal Felman, Bioeconomy Science Institute

I hope for a future where native plantings on Canterbury farms are a common part of the landscape, supporting populations of beneficial insects alongside productive crops. I hope this leads to healthier ecosystems, improved crop pollination, reduced reliance on chemicals, and more resilient farming systems. Ultimately, I hope Canterbury becomes a place where productive agriculture and native biodiversity flourish side by side.

– Melanie Walker, Bioeconomy Science Institute

Modern agriculture has relied heavily on pesticides and introduced species, often overlooking the quiet work of our native insects. Yet many are powerful allies, pollinating crops and naturally controlling pests. Too often, their ties to native habitats have been seen as a limitation. But the real question is not whether they belong in our farms, but why we have not yet made space for them.

This guide invites farmers, scientists, and tree planters to reimagine what is possible, to design native plantings that support beneficial insects, build resilience, and help restore Canterbury's living landscapes. In doing so, we shift from managing against nature to farming with it — and that is where true sustainability begins.

– Brad Howlett, Project Leader, Bioeconomy Science Institute

What excites me most is that this work opens the door to a different way of thinking about biodiversity in the primary sector. Not as something on the side of farming, but as something that can actively support more resilient and functional production systems.

– Nico Bordes, Bioeconomy Science Institute

I hope this work helps show that supporting beneficial insects is not just an environmental add-on, but a practical part of farming well. By recognising the roles that native bees, flies, and other beneficial species have in pollination and pest control, growers can begin to view insects with more nuance and see the value that diversity brings to productive systems.

I would like to see the ideas from this project integrated into plantings across Canterbury — where they are designed with multiple goals in mind, supporting beneficial insects alongside aesthetics, shelter etc. I also hope that growers are encouraged to consider how their decisions can benefit neighbouring farms, and that over time, native plantings become a normal feature of the landscape.

– Eddy Dowle, Bioeconomy Science Institute

SECTION 8 –
**Acknowledgements
and references**



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References

- Williams K. n. d. Native plant communities of the Canterbury Plains. <https://www.doc.govt.nz/globalassets/documents/conservation/native-plants/motukarara-nursery/canterbury-plains-plant-communities-book-full.pdf> (accessed 9 March 2026).
- Meurk C 2008. Vegetation of the Canterbury Plains and downlands. The natural history of Canterbury. Christchurch, University of Canterbury Press. Pp.195–250.
- Rader R, Howlett BG, Cunningham SA, Westcott DA, NewstromLloyd LE, Walker MK, Teulon DA, Edwards W 2009. Alternative pollinator taxa are equally efficient but not as effective as the honeybee in a mass flowering crop. *Journal of Applied Ecology* 46: 1080–1087
- Tschumi M, Albrecht M, Collatz J, Dubsy V, Entling MH, NajarRodriguez AJ, Jacot K. 2016. Tailored flower strips promote natural enemy biodiversity and pest control in potato crops. *Journal of Applied Ecology*. 53: 1169–76.
- Howlett BG, Davidson MM. 2025. Native plantings for beneficial insects in Canterbury. *New Zealand Journal of Ecology* 49: 1–10.
- Hooper DU, Chapin III FS, Ewel JJ, Hector A, Inchausti P, Lavorel S, Lawton JH, Lodge DM, Loreau M, Naeem S 2005. Effects of biodiversity on ecosystem functioning: a consensus of current knowledge. *Ecological Monographs* 75: 3–35.
- Davidson MM, Howlett BG 2023. Native plants support more insect pollinator species than expected. *The Wētā*: 57: 23–28.
- Howlett BG, Todd JH, Willcox BK, Rader R, Nelson WR, Gee M, Schmidlin FG, Read SFJ, Walker MK, Gibson D, Davidson MM 2021. Using non-bee and bee pollinator-plant species interactions to design diverse plantings benefiting crop pollination services. *Advances in Ecological Research* 64: 45–103.
- Garibaldi et al 2016. Mutually beneficial pollinator diversity and crop yield outcomes in small and large farms. *Science* 351 (6271)
- Thompson FC 2008. A conspectus of New Zealand flower flies (Diptera: Syrphidae) with the description of a new genus and species. *Zootaxa*. 1716: 1–20.
- Valentine EW 1967. A list of the hosts of entomophagus insects of New Zealand. *New Zealand Journal of Science*.10: 1100–1210.
- Wratten SD, White AJ, Bowie MH, Berry NA, Weigmann U. 1995. Phenology and ecology of hoverflies (Diptera: Syrphidae) in New Zealand. *Environmental Entomology*. 24 :595–600.
- Howlett BG, Butler RC, Nelson W, Donovan BJ. 2013. Impact of climate change on crop pollinator activity in New Zealand. Ministry for Primary Industries Wellington. <https://www.mpi.govt.nz/dmsdocument/4101/direct> Accessed 2026-04-20.
- Martin NA 2015. Small hover fly - *Melanostoma fasciatum* Interesting Insects and other Invertebrates. <https://interestinginsects.landcareresearch.co.nz/taxa/6a6bf449-b325-4dc8-9d1c-29c593d5ea9f> 2026-03-28 Accessed 2026-03-29.
- MacDonald FH, Connolly PG, Larsen NJ, Walker GP. 2016. The voracity of five insect predators on *Bactericera cockerelli* (Sülc) (Hemiptera: Trioizidae) (tomato potato psyllid; TPP). *New Zealand Entomologist*. 39: 15–22.
- Wise KA. 1991. Distribution and zoogeography of New Zealand Megaloptera and Neuroptera. *Records of the Auckland Institute and Museum*. 20: 211–27
- Martin NA 2017. Tasmanian lacewing - *Micromus tasmaniae* Interesting Insects and other Invertebrates. <https://interestinginsects.landcareresearch.co.nz/taxa/828fc76c-2ba3-4222-806c-c24b9d566e45> Accessed 2026-03-30.
- Hilson RJ. The ecology of *Micromus tasmaniae* (Walker). (Master of Science dissertation, University of Canterbury).
- New TR 2002. Prospects for extending the use of Australian lacewings in biological control. *Acta Zoologica Academiae Scientiarum Hungaricae*. 48: 209–16.
- MacDonald FH, unpublished data.
- Schnitzler F-R 2016. Tachinidae of New Zealand. <https://www.landcareresearch.co.nz/discover-our-research/restoring-ecosystems/plants-invertebrates-fungi-and-bacteria/invertebrate-systematics/tachinidae> Accessed 2026-03-31.
- Stireman III JO, O'Hara JE, Wood DM 2006/ Tachinidae: evolution, behavior, and ecology. *Annual review of entomology*. 51: 525–55.
- Thomas WP 1963. A natural enemy of the common grass grub, *Costelytra zealandica* White. *New Zealand Entomology* 3: 15–18.
- Early JW 1984. Chapter 16 Parasites and predators. Scott RR (Ed.) *New Zealand pest and beneficial insects*. Lincoln University of Agriculture, New Zealand Pp. 271–308.
- Shaw PW, Lo P, Wallis DR 2001. Recent introduction and establishment of the leafroller parasitoid *Trigonospila brevifacies* (Hardy)(Diptera Tachinidae) in Nelson. *New Zealand Plant Protection*. 54: 33–36.
- Miller D 1971. Common insects in New Zealand. Wellington, A. H. & A. W. Reed. 178 p.
- Edirisinghe HM. 2021. Biology and behaviour of New Zealand ladybirds: insights into the establishment success of introduced species. (Doctoral dissertation, Massey University).
- Triltsch H. 2013. Food remains in the guts of *Coccinella septempunctata* (Coleoptera: Coccinellidae) adults and larvae. *EJE*. 96: 355–64.
- Martin NA 2016. Eleven-spotted ladybird - *Coccinella undecimpunctata*. Interesting Insects and other Invertebrates. <https://interestinginsects.landcareresearch.co.nz/taxon/57a19cb5-dd5f-43c6-81d9-ce1af8f0f6c0> Accessed 2026-03-26.
- French RA 1966. The biology and ecology of *Coccinella undecimpunctata* undecimpunctata L.: Master of Agricultural Science with Honours Thesis, Lincoln College, University of Canterbury.
- Schnitzler F-R & Ward DF. 2013. Key to Ichneumonidae in New Zealand. v1.0. <http://ichneumonidae.landcareresearch.co.nz> Accessed:2026-04-20

32. Talekar NS, Shelton AM 1993. Biology, ecology, and management of the diamondback moth. Annual review of entomology. 38: 275-301.
33. Lavandero B, Wratten S, Shishehbor P, Worner S 2005. Enhancing the effectiveness of the parasitoid *Diadegma semiclausum* (Helen): movement after use of nectar in the field. Biological control. 34: 152-8.
34. Dosdall LM, Zalucki MP, Tansey JA, Furlong MJ 2012. Developmental responses of the diamondback moth parasitoid *Diadegma semiclausum* (Hellen) (Hymenoptera: Ichneumonidae) to temperature and host plant species. Bulletin of entomological research.102: 373-84.
35. Walker GP, Qureshi MS, Wallace AR 2004. Parasitism of lepidopteran larvae collected from vegetable crops and associated weeds at Pukekohe. New Zealand Plant Protection. 57: 1-7.
36. Donovan BJ 2007. Apoidea (Insecta: Hymenoptera). In Fauna of New Zealand, Landcare Research Ltd. 295 p.
37. Howlett BG, Cutting BT, Dowle EJ, Gee M, Read SFJ, Walker MK, Evans, LJ 2025. Bee diversity and crop pollination in low-diversity regions: Balancing global insights and local contexts. Advances in Ecological Research. 73: 39-86.
38. Donovan BJ, Macfarlane RP 1984. Chapter 15. Bees and pollination. Scott RR (Ed.) New Zealand pest and beneficial insects. Lincoln University of Agriculture, New Zealand Pp. 247-270.
39. Howlett BG, Unpublished data
40. Richards MH, Packer L. 2021. *Lasioglossum*. In Encyclopedia of Social Insects. Starr CK (Ed.) Springer International Publishing, Cham, Switzerland Pp. 550-554.
41. Howlett BG, Walker MK, Rader R, Butler RC, Newstrom-Lloyd LE, Teulon DA 2011. Can insect body pollen counts be used to estimate pollen deposition on pak choi stigmas. New Zealand Plant Protection 64: 25-31.
42. Riley M. Māori Healing and Herbal: New Zealand Ethnobotanical Sourcebook. Viking Sevenses N.Z.
43. Crowe A. 1997. A field guide to the native edible plants of New Zealand. Penguin Group (NZ).
44. de Lange P.J. 2026. *Shawia adenocarpa* Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. <https://www.nzpcn.org.nz/flora/species/shawia-adenocarpa/> (accessed 15 November 2025). Accessed 2025-11-15
45. Te Māra Reo the language garden 2026. Tauhinu. <https://www.temarareo.org/PPN-Tausinu.html> Accessed 2026-03-31
46. Arahanga H., personal communication, 31 March 2026.
47. Clinch PG, Palmer-Jones T, Forster IW. 1972. Effect on honey bees of nectar from the yellow kōwhai (*Sophora microphylla* Ait.). New Zealand Journal of Agricultural Research. 15:194-201.
48. Herbs and Remedies, Prema 2026. *Corokia* spp. Korokio. <https://www.herbs.prema.net.nz/blog/post/corokia-spp-korokio#> Accessed 2026-03-31



SECTION 9 –
Appendices



Insect pest names

Common name	Scientific name
Apple leafcurling midge	<i>Dasineura mali</i>
Argentine stem weevil	<i>Listronotus bonariensis</i>
Australian crop mirid	<i>Sidnia kinbergi</i>
Berry aphids	<i>Chaetosiphon fragaefolii</i> , <i>Myzus persicae</i> , <i>Aphis idaei</i> , <i>Aphis gossypii</i> , <i>Hyperomyzus lactucae</i> , <i>Nasonovia ribisnigri</i> , <i>Amphorophora rubi</i>
Brassica aphids	<i>Myzus persicae</i> , <i>Brevicoryne brassicae</i>
Bronze beetle	<i>Eucolaspis brunnea</i>
Cabbage whitefly	<i>Aleyrodes proletella</i>
Carrot rust fly	<i>Chamaepsila rosae</i>
Cereal & corn aphids	<i>Rhopalosiphum padi</i> , <i>Metopolophium dirhodum</i> , <i>Sitobion miscanthi</i> , <i>Rhopalosiphum maidis</i>
Clover root weevil	<i>Sitona lepidus</i>
Codling moth	<i>Cydia pomonella</i> (syn. <i>Carpocapsa pomonella</i>)
Cosmopolitan/Northern armyworm	<i>Mythimna separata</i>
Current clearwing moth	<i>Synanthedon tipuliformis</i>
Cyclamen mite	<i>Phytonemus pallidus</i>
Diamondback moth	<i>Plutella xylostella</i>

Common name	Scientific name
European leaf miner	<i>Liriomyza</i> sp.
Fall armyworm	<i>Spodoptera frugiperda</i>
Froggatt's apple leafhopper	<i>Edwardsiana crataegi</i>
Grape phylloxera	<i>Daktulosphaira vitifoliae</i> (syn. <i>Phylloxera</i>)
Grass grub	<i>Costelytra giveni</i> (previously <i>Costelytra zealandica</i>)
Greasy cutworm	<i>Agrotis ipsilon</i>
Green looper	<i>Chrysodeixis eriosoma</i>
Green potato bug	<i>Cuspicona simplex</i>
Green vegetable bug	<i>Nezara viridula</i>
Greenhouse whitefly	<i>Trialeurodes vaporariorum</i>
Leafrollers	<i>Tortricidae</i> : <i>Ctenopseustis obliquana</i> , <i>Planotortrix excessana</i> , <i>Epiphyas postvittana</i>
Lucerne flea (Clover flea)	<i>Sminthurus viridis</i>
Lucerne weevil	<i>Sitona discoideus</i>
Mealybugs	Family: <i>Pseudococcidae</i> (incl. <i>Phenacoccus</i> , <i>Pseudococcus</i>)
Mites (e.g. brown, red and two spotted)	Class: <i>Arachnida</i> incl. brown, red and two spotted mites
New Zealand raspberry bud moth	<i>Heterocrossa rubophaga</i>

Common name	Scientific name
Nysius (wheat bug)	<i>Nysius huttoni</i>
Oriental fruit moth	<i>Grapholita molesta</i>
Passionvine hopper	<i>Scolypopa australis</i>
Pasture & clover aphids	<i>Acyrtosiphon pisum</i> , <i>Acyrtosiphon kondoi</i> , <i>Therioaphis maculata</i>
Pear and cherry slug	<i>Caliroa cerasi</i> (syn. <i>Eriocampoides cerasi</i>)
Pear leaf blister mite	<i>Eriophyes pyri</i>
Pear leaf-curling midge	<i>Dasineura pyri</i>
<i>Porina</i> sp.	<i>Wiseana cervinata</i> , <i>Wiseana despecta</i> , <i>Wiseana umbraculata</i>
Potato mirid	<i>Closterotomus norvegicus</i>
Potato tuber moth	<i>Phthorimaea operculella</i>
Red legged earth mite	<i>Halotydeus destructor</i>
Scale	Family: <i>Coccoidea</i> incl. Black, Brown Soft, California Red, Cottony Cushion, Oystershell, San Jose, Felted Pine, Greedy, Hemispherical, Chinese wax and Wax scale
Seedcorn maggot	<i>Delia platura</i>
Slugs	Class: <i>Gastropoda</i> incl. grey field, brown field, keeled field
Solanaceae aphids	<i>Macrosiphum euphorbiae</i> , <i>Myzus persicae</i> , <i>Aulacorthum solani</i>
Southern armyworm	<i>Persectania aversa</i>
Soybean looper	<i>Thysanoplusia orichalcea</i>
Springtails	Class: <i>Collembola</i>

Common name	Scientific name
Tomato fruitworm/Cotton bollworm moth	<i>Helicoverpa armigera</i>
Tomato potato psyllid	<i>Bactericera cockerelli</i>
Tomato stem borer	<i>Symmetrischema tangolias</i>
Thrips – flower & onion	<i>Frankliniella occidentalis</i> , <i>Frankliniella intonsa</i> , <i>Thrips tabaci</i>
Tropical armyworm	<i>Spodoptera litura</i>
Vegetable aphids	<i>Neotoxoptera formosana</i> , <i>Aphis gossypii</i> , <i>Cavariella aegopodii</i> , <i>Nasonovia ribisnigri</i> , <i>Myzus persicae</i> , <i>Macrosiphum euphorbiae</i> , <i>Aulacorthum solani</i> , <i>Rhopalosiphum maidis</i>
White butterfly	<i>Artogeia rapae</i>
Whitefringed weevil	<i>Naupactus leucoloma</i> (syn. <i>Graphognathus leucoloma</i>)
Wireworms	<i>Agrypnus variabilis</i>
Wooly apple aphid	<i>Eriosoma lanigerum</i>



Native plant names (ordered by botanical name)

To make the guide easy to navigate, plant names are ordered alphabetically by common name throughout the main sections. This list is ordered alphabetically by genus name, so readers familiar with plant classification can easily find related species.

Common name	Māori name	Botanical name	Page number
NZ Broom	Mākaka	<i>Carmichaelia australis</i>	98
Marbleleaf	Putaputawētā	<i>Carpodetus serratus</i>	84
Cabbage tree	Tī kōuka	<i>Cordyline australis</i>	62
Wire-netting bush	Korokio	<i>Corokia cotoneaster</i>	112
Matagouri	Tūmatakuru	<i>Discaria toumatou</i>	86
NZ Broadleaf	Kāpuka	<i>Griselinia littoralis</i>	96
Narrow-leafed lacebark	Houhi	<i>Hoheria angustifolia</i>	94
Kanuka	Kānuka	<i>Kunzea ericoides</i>	76
Manuka	Mānuka	<i>Leptospermum scoparium</i>	82
NZ Myrtle	Rōhutu	<i>Lophomyrtus obcordata</i>	100
Shrubby Tororaro	Tororaro	<i>Muehlenbeckia astonii</i>	102
Creeping pōhuehue	Pōhuehue	<i>Muehlenbeckia axillaris</i>	68
Wire vine	Pōpōhue	<i>Muehlenbeckia complexa</i>	110
Cottonwood	Tauhinu	<i>Ozothamnus leptophyllus</i>	66



Common name	Māori name	Botanical name	Page number
Mountain flax	Wharariki	<i>Phormium cookianum</i>	90
Flax	Harakeke	<i>Phormium tenax</i>	72
Lemonwood	Tarata	<i>Pittosporum eugenioides</i>	78
Lowland ribbonwood	Mānatu	<i>Plagianthus regius</i>	80
Narrow-leaf pomaderris	Tauhinu	<i>Pomaderris phyllicifolia</i>	92
Five finger	Whauwhaupaku	<i>Pseudopanax arboreus</i>	70
Canterbury Plains tree daisy		<i>Shawia adenocarpa</i> *	64
Mountain akeake	Mountain akeake	<i>Shawia avicenniiifolia</i> **	88
Golden akeake	Akiraho	<i>Shawia paniculata</i> ***	74
Weeping kōwhai	Kōwhai	<i>Sophora microphylla</i>	106
<i>Teucrium parvifolium</i>		<i>Teucrium parvifolium</i>	104
Willow-leaf hebe	Koromiko	<i>Veronica salicifolia</i>	108
Banks Peninsula hebe	Kōkōmuka	<i>Veronica strictissima</i>	60

* formerly *Olearia adenocarpa*

** formerly *Olearia avicenniiifolia*

*** formerly *Olearia paniculata*

Beneficial insect names

Plant Guide name	Family	Genus	Species
Honey bee	Apidae	<i>Apis</i>	<i>Apis mellifera</i>
Bumble bee – buff-tailed	Apidae	<i>Bombus</i>	<i>Bombus terrestris</i>
Bumble bees – other	Apidae	<i>Bombus</i>	<i>Bombus hortorum/ruderatus</i>
Sweat bee	Halictidae	<i>Lasioglossum</i>	<i>Lasioglossum sordidum</i>
<i>Leioproctus</i> bees – black	Colletidae	<i>Leioproctus</i>	
<i>Leioproctus</i> bee – orange	Colletidae	<i>Leioproctus</i>	<i>Leioproctus fulvescens</i>
Masked bees	Colletidae	<i>Hylaeus</i>	
Blow fly – brown	Calliphoridae	<i>Calliphora</i>	<i>Calliphora stygia</i>
Blow fly – European blue	Calliphoridae	<i>Calliphora</i>	<i>Calliphora vicina</i>
Blow flies – other	Calliphoridae		
Pollenia fly – bronze cluster	Calliphoridae	<i>Pollenia</i>	<i>Pollenia pediculata</i>
Pollenia flies – other	Calliphoridae	<i>Pollenia</i>	
Bristle fly – ginger blister	Tachinidae	<i>Protohystricia</i>	<i>Protohystricia alcis</i>
Bristle fly – Australian leaf roller	Tachinidae	<i>Trigonospila</i>	<i>Trigonospila brevifacies</i>
Bristle flies – blue	Tachinidae		
Bristle flies – green	Tachinidae		
Bristle flies – grey-black	Tachinidae		
Bristle flies – other	Tachinidae		
Striped flesh fly	Sarcophagidae	<i>Oxysarcodexia</i>	<i>Oxysarcodexia varia</i>
Muscid fly – blue	Muscidae	<i>Australophyra</i>	<i>Australophyra rostrata</i>

Plant Guide name	Family	Genus	Species
Muscid flies – other	Muscidae		
Drone fly	Syrphidae	<i>Eristalis</i>	<i>Eristalis tenax</i>
Hover fly – NZ blue	Syrphidae	<i>Helophilus</i>	<i>Helophilus hochstetteri</i>
Hover fly – NZ black	Syrphidae	<i>Melangyna</i>	<i>Melangyna novaezelandiae</i>
Hover fly – NZ orange	Syrphidae	<i>Melanostoma</i>	<i>Melanostoma fasciatum</i>
Hover fly – streaktail	Syrphidae	<i>Allograpta</i>	
Hover fly – globetail	Syrphidae	<i>Sphaerophoria</i>	<i>Sphaerophoria macrogaster</i>
Hover flies – other	Syrphidae		
Green soldier fly	Stratiomyidae	<i>Odontomyia</i>	
March fly	Bibionidae	<i>Dilophus</i>	<i>Dilophus nigro stigma</i>
Lacewing – brown	Hemerodiidae	<i>Micromus</i>	<i>Micromus tasmaniae</i>
Ladybird beetle – 11 spotted	Coccinellidae	<i>Coccinella</i>	<i>Coccinella undecimpunctata</i>
Ladybird beetle – 2 spotted	Coccinellidae	<i>Adalia</i>	<i>Adalia bipunctata</i>
Parasitoid wasps – ichneumonid	Ichneumonidae		
Parasitoid wasps – other	Order: Hymenoptera		

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