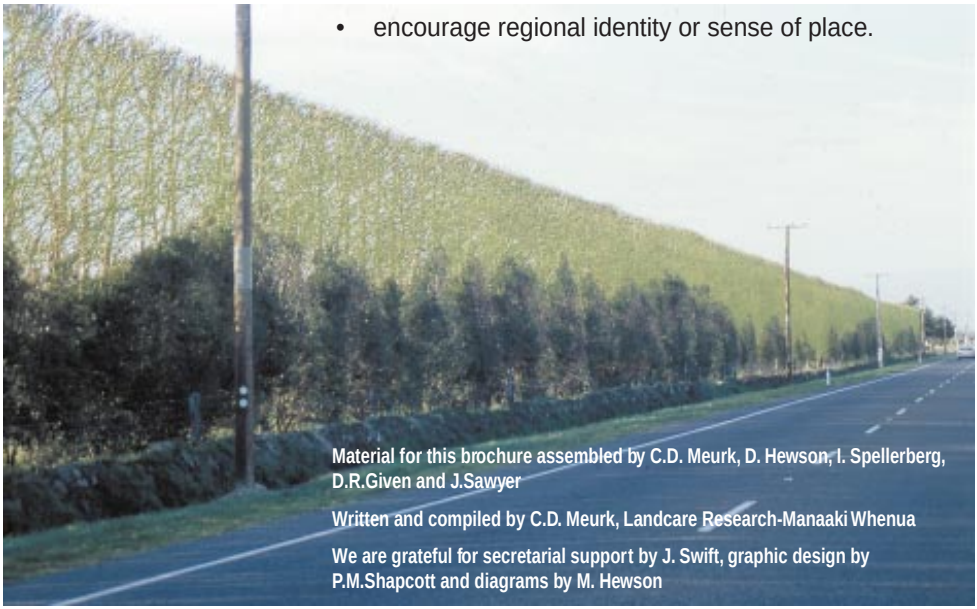
Establishing shelter in Canterbury with Nature Conservation in mind

A practical guide – for the true Cantabrian!

Hedgerows and shelterbelts are **living windbreaks** that can protect and preserve the environment and our cultural history. They actively:

- shelter livestock and crops
- contribute to biodiversity goals (natural variety of plants, animals and habitats)
- create sanctuaries for bio-control agents
- reduce erosion
- form habitats and corridors for wildlife
- support rare plants and our natural treasures or taonga
- create mature, interesting and diverse landscapes
- enhance our 'clean green' image
- provide attractive visual screening
- encourage regional identity or sense of place.



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We are grateful for secretarial support by J. Swift, graphic design by P.M.Shapcott and diagrams by M. Hewson

Black matipo and willow shelterbelt on heavy soil

How Shelter brings Biodiversity into your Landscape

Techniques for establishing rapid and efficient shelter across the windswept Canterbury Plains are well researched and practised (see references). Exotic pines, macrocarpa, poplars, willows, gums, hawthorn, gorse and pampas grass undoubtedly grow fast, but may become weeds – and mostly offer limited value to native wildlife. There is a great opportunity to foster the wider community interest in diversity within the **300 000 km of utilitarian shelter** that criss-crosses the plains.

Mixtures of both native and exotic species may give optimal benefits of shelter, permeability, low maintenance, biodiversity and resistance to drought, frost and snow break.

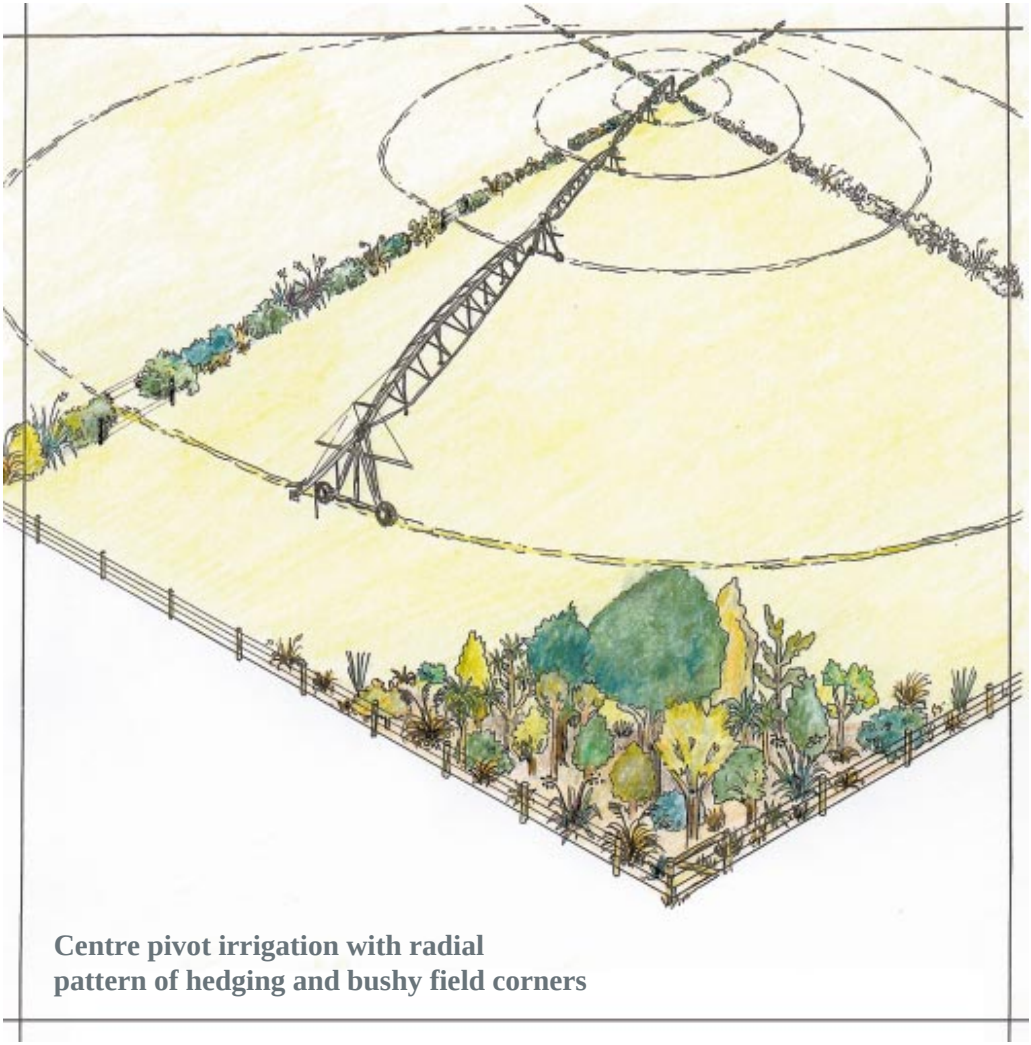
Together the natural pohuehue hedge (Muehlenbeckia) and cabbage tree standard provide fruit and foliage for native birds, lizards and butterflies

Integrating nature and production is a means of fulfilling Regional Policies (Environment Canterbury-CRC 1998) and 'Biowhat?' goals.

The indigenous plants and wildlife that once characterised lowland Canterbury are mostly gone. But tiny fragments of natural habitat do survive on the plains - cabbage trees, NZ flax/harakeke, kowhai, pohuehue (*Muehlenbeckia*), bracken, sedges and rushes - in hedges and paddocks or along streams and ditches. These provide glimpses of past history and are important food sources for native birds, lizards and insects. The hedges and shelterbelts that bound our farmlands thus lend themselves to restoration of habitat, biodiversity and linkages whilst providing for other farming needs. They can be similar to the traditional hedgerows of England - bastions of biodiversity that have enriched rural lands for centuries. Following this example provides a simple and practical approach to **integrating biodiversity and production**.

Lemonwood is an increasingly popular shelter species on medium land with moderate frost risk

Centre-pivot irrigation is the new technology of the plains with new possibilities for incorporating low, radial hedging - with gaps for wheel tracks - and bush patches in field corners. Suitable species are identified in the Appendix.



Centre pivot irrigation with radial pattern of hedging and bushy field corners

How to Create Biodiverse Shelter

1. Protecting remnant plants and habitats

The cheapest and most effective form of nature conservation is to **protect existing primary habitats** by fencing and managing them (Davis & Meurk 2001). Remnant trees and shrubs may be centuries old and, with all their dependent microbes, insects, reptiles and birds, are irreplacable in your lifetime. Yet we are still destroying what little is left! Stream remnants and swamp plants in drains or wetland areas are good places to start protection; shrubby road verges are already fenced; some remnant kanuka still forms natural shelter in the Eyrewell and Maronan districts preserving a distinctive historical landscape (see back page).

2. Enriching and enhancing existing plantings

Gorse hedges often have tangles of pohuehue (*Muehlenbeckia complexa*) which provide food for butterflies and birds. Such 'starters' can be further **enhanced by enrichment planting** of a greater range of fruit- and nectar-providing species. They then also become an active and self-reinforcing part of the landscape. By being dispersed and regenerating naturally in suitable locations, they in turn provide more food for wildlife, and so on. As well as providing shelter and berries or nectar, planting of totara, matai, beech and kanuka may in the future be sustainably harvested for various uses.

An alder shelter belt with an understory of young native trees. Note: alder may seed into wetlands and along streams

To interplant or underplant an existing hedge or shelterbelt you will need to thin or find gaps among the trees or shrubs. You will ideally dig out competing roots for at least a 50 cm diameter before planting. It will be very tough around very old trees so plant as far away from trunks as possible. Seedlings will eventually fill in the gaps.

3. Starting from scratch

We are usually in the position of starting from scratch - often an uphill battle - or buffering around remnant vegetation. However, when starting from bare land you can prepare the ground better (see the calendar and references for details). Initially, mixtures of indigenous and exotic species may provide the right combination of amenity, resilience and mutual, nursery-like protection.

Always establish the hardiest species first:

- those that need full sunlight (O in appendix), or are species tolerant of coastal exposure (C),

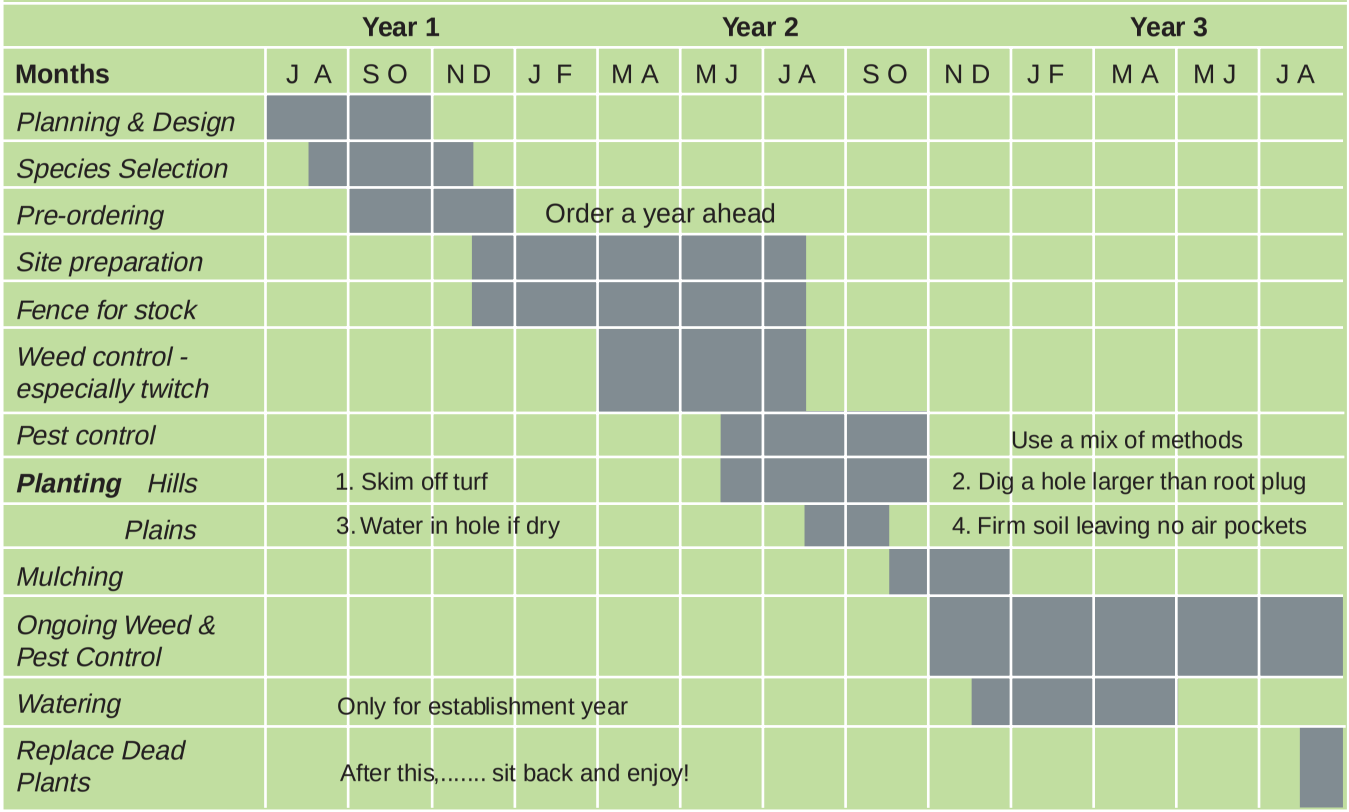
Delay establishment of sensitive species:

- species needing initial shelter (S) or drought or frost tender (DT, FT) plants can be inter- or underplanted in later years. Some farmers have used temporary shade-cloth in very exposed places to provide plants with a good start.

The **essential steps** for any large scale planting are planning, design, selection and ordering of plants, preparing the site in time, excluding stock, having an effective weed and pest control programme, planting correctly, mulching and managing through to self maintenance. See the following **Task Calendar**, the **Essential Tips**, **Design Ideas** and **References** for further details. The listed **species** (see Appendix) are suitable for hedgerow and shelterbelt planting in Canterbury.

Mixed shelterbelt of black matipo, lemonwood, ribbonwood, narrow-leaved lacebark and eucalyptus

A Calendar for creating biodiverse shelter



***Note**, the optimal **planting time** for inland Canterbury is September – past the main danger period for frost and before the summer drought. Herbicide is ineffective or slow to act in the winter months so pre-planting weed control must take this into account. For pest control use tree protectors, old tyres or other guards, repellents, or kill with poisons, traps or shooting. If watering is needed to save plants during a first season drought, irrigate generously but infrequently.*

Read these Lips for ESSENTIAL Tips!

Preparation

- **Don't bite off more than you can chew** – or you will get indigestion from trying to chew too many weeds and pests! Experiment on a small scale first, to see what works before committing and risking major resources.
- Get the **right plants for the right place, and use good quality stock** – know your climate, soils and optimal planting times! Native plants often get a bad reputation because they are put in the worst (ecologically inappropriate) places and – surprise surprise – they don't grow!

Planting

- Soak plant roots **before planting.**
- **Dig a hole bigger and deeper** than the root ball.
- **Cut** off tangled and matted roots.
- Set the plant into worked soil at the bottom of the hole; **pack crumbled soil** around roots; **avoid air pockets.**
- cover exposed potting mix with soil.
- Plant **deeper in dry** environments (with the collar below natural soil surface) and **shallower in permanently moist** sites (collar at soil surface).

Maintenance

- **Don't use weedeaters around young plants** without hand-clearing the grass first! Ring-barking is one of the most common causes of plant mortality – and contractors **DO** need to be told!

- **Don't spray grass around native plants UNLESS** you really know what you're doing – the most valuable plants are extremely sensitive and the merest whiff of drift may be enough to send your carefully nurtured kanuka, kowhai, or totara to an early grave.
- **Don't let dense grass grow around young plants** – keep them weeded or apply mulch or weed mats. Let only experienced operators release spray – with a spray guard or a grass specific herbicide.

Mulch and protection on light land with rabbit/hare risk

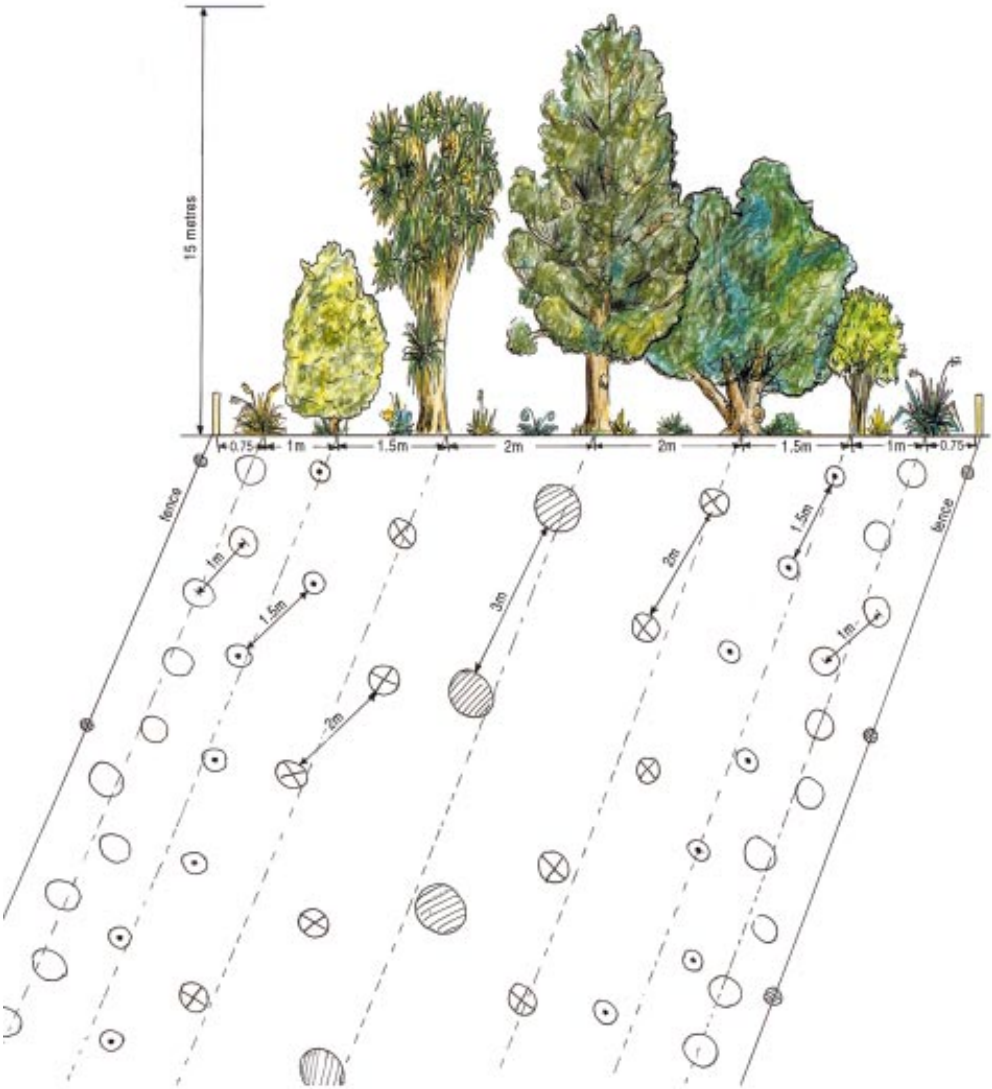
- If there is any doubt about ability to maintain continual weed control, **stake all small plants** so they can be found in the long grass – and not by the whoops method!
- **Control pests** – absolutely! Many native plants are icecream to voracious pests!

Be assured, if you don't take heed of this advice it will end up costing you big time - in dollars, disappointment and frustration!

Design Ideas

There are various form and function considerations and the references below provide some ideas – see Nigel Buttery, Larry Price, Gabites & Lucas. In general one should aim for 1-2m spacings of plants in 2-7 rows that eventually form 2-4 tiers with a diverse array of species. Aesthetic and ecological factors include balance, texture, colour, form, randomness, natural gradation of margins - and whimsy!

Cost is always on the mind. 100 metres of 3-row, double fenced shelterbelt will have start-up costs in the order of $400 to $500 (plants) + herbicide, fencing, ripping, mulching, pest control and labour. Annual maintenance costs for at least 3-4 years will be about $100 per 100 metre per year. It may end up costing you more if you take short cuts and have to replant. Hedges with only 1-2 rows, or using existing shelter for interplanting, will require fewer plants and less money, but the wider the better for habitat purposes. Field corners can support greater diversity of species – the exposed edges should be tapered to the wind with small-leaved shrubs, and the interior can support taller or more delicate species including hardy ferns.



A design for a wide, biodiverse shelterbelt in good growing conditions

Once canopy is partially established, shade-tolerant tussocks, ferns, lilies, and frost-tender trees can be introduced. Avoid planting in dead straight lines. The same sequence can be used on a narrow (one sided) shelter belt or hedge, in a field corner, or as a buffer for remnant bush.

Note: assumes electric outrigger to stop stock reaching through.

Other Information Sources

Christchurch City Council 2000. *Christchurch Naturally – discovering the City's wild side.*

Davis, M, Meurk, C. 2001. *Protecting and restoring our natural heritage – a practical guide.* Dept of Conservation, Christchurch. Available also on the web: www.doc.govt.nz regional-infoCanterbury/Publications/Protecting and Restoring our Natural Heritage….

Environment Canterbury brochures and booklets: Nigel Buttery on 'wide shelter for native plants'.

Environment Canterbury – Canterbury Regional Council 1998. *Regional Policy*.

The Quick Find Guide to Growing Native Plants. A Viking book, 1997, by Andrew Crowe. ISBN 067087642 9

Gabites, I, Lucas, R. 1998. *The Native Garden – design themes from wild New Zealand.* Godwit, Auckland.

Meurk, C.D, Swaffield, S.R. 2000. A landscape ecological framework for indigenous regeneration in rural New Zealand-Aotearoa. *Landscape and Urban Planning 50:* 129-144.

Ministry for the Environment 2000. *Biowhat?*

Parliamentary Commissioner for the Environment 2002. *Weaving resilience into our working lands – future roles for native plants on private land.*

Porteous, T. 1993. *Native forest restoration – a practical guide for landowners*. QEII Trust & Monsanto.

Planterguide in www.bush.org.nz allows native species selection for any part of lowland New Zealand.

Price, L.W. 1993. Hedges and shelterbelts on the Canterbury Plains, New Zealand: transformation of an Antipodean landscape. *Annals of the Association of American Geographers 83*: 119-140.

Spellerberg, I. 2001. Wildlife corridors: fact or fiction? Planning Quarterly, June: 26-27.

Nurseries that Specialise in Native Plants (listed from North to South)

We recommend use of local Canterbury species and seed sources; always seek certification.

Kaikoura Nurseries Ltd - Main North Rd; Ph 03 319 5851

Broadleaf Nursery - 308 Rangiora-Woodend Rd; Ph 03-313 5315.

Wai-Ora Forest Landscapes Ltd - 48 Watsons Rd, Harewood; Ph 03-359 2458.

Trees for Canterbury - 261 Opawa Rd, Christchurch; Ph 03-332 8586.

Letzgo Native Nurseries - Governors Bay; Ph 03-329 9833.

Motukarara Nursery (DOC); Ph 03-329 7846.

Lothlorien Nursery - Whitecliffs Rd, Coalgate; Ph 03-318 2911.

Lakeways Nursery - Grahams Rd, Tinwald; Ph 03 308 9950

Wilsons Garden Makers - Robinson St, Ashburton; Ph 03 308 4630

Opuha Nurseries - Geraldine; Ph 03-693 9283.

Matai Nurseries - McNamara Rd, Waimate; Ph 0800 262 8240, 03 689 8928

Small-leaved coprosmas, myrtle, NZ jasmine and clematis can be clipped into a tidy hedge

Appendix

Indigenous Species for Hedgerows and Shelterbelts in Canterbury

The bolded species are the hardiest and most vigorous for immediate results, but others may be gradually introduced once some shelter and structure has been established - to increase diversity, versatility and interest. Many other species may be grown if you have very good growing conditions – adequate moisture, fertility and established shelter. In general we recommend the use of local species and provenances. Make sure you specify these from the nursery; it is not unknown for some

Formal plant name	common name	suitable zone	frost tender
Trees, shrubs & vines			
Aristotelia fruticosa	**mountain wineberry**	3,4 ✂❑†	
Aristotelia serrata	**wineberry, makomako**	1,2	FT
Carmichaelia australis/petriei	NZ broom	3,4	
Carmichaelia torulosa	Canterbury broom	2,3❑†	
Carpodetus serratus	marbleleaf, putaputaweta	1,2 ✂†	FT
Clematis foetida	clematis	1,2,3 ✂❑†	FT
Clematis forsteri	clematis (& c.marata type)	1,2,4 ✂❑†	
Coprosma acerosa	**sand coprosma**	1,3 ✂†	
Coprosma crassifolia	**mikimiki**	1,3 ✂❑†	
Coprosma intertexta	**mikimiki**	3,4	
Coprosma linariifolia	yellow wood	1,2,3❑	FT

Key:

Zones:
These are the regions where the species are most likely to prosper, not the only places they will grow -

1 Banks Peninsula & coastal hills
2 inland foothills
3 Plains
4 High country

✂ Able to be trimmed or hedged.

❑ Suitable for low hedges in centre-pivot irrigation (CPI) systems.

† Tolerant of some browsing pressure *once established*.

Bold names are robust & vigorous spp in Canterbury in the context of their stated preferences

non-specialist nurseries to supply South American pampas grass, Australian Ngaio and North Island lacebarks in place of toetoe and South Island or NZ provenances. We have nevertheless included a few non-local indigenous plants because their use is so widespread and successful, and they have shown limited capacity to spread or infiltrate local gene pools.

drought tender	needs full sun	coastal tolerance	needs initial shelter	growth form	wildlife value
	O			dense shrub	berries
DT			S	small deciduous tree	berries
	O	C		open shrub	nectar
	O			open shrub	nectar
DT			S	medium tree	nectar/berries
DT			S	vine	nectar
DT			S	vine	nectar
	O	C		dense shrub	blue berries
	O	C		dense shrub	berries
	O			open shrub	blue berries
DT			S	open shrub	berries

to P16 ☞

FT The most frost tender spp in Canterbury context (usually absent from zones 3 & 4 unless there is full overhead shelter).

DT The most drought tender spp in Canterbury context; needing moist soils.

O Needs full sun or at most only partial shade.

C Tolerant of salt spray and coastal exposure.

S Needs some shelter from strong drying wind and frost; interplant for diversity and wildlife.

Wildlife value is the main value of fruits or flowers for birds & lizards. *"Berries"* is a general term for fleshy fruits eaten by birds and lizards - especially blue fruits in latter case. Most dry fruits are nevertheless associated with flowers that are visited by insects for pollen or nectar.

Formal plant name	common name	suitable zone	frost tender
Coprosma lucida	shining karamu	1,2,3 ~ ❑	FT
Coprosma "parviflora"	mikimiki	1,2,3,4 ~ ❑ †	
Coprosma pedicellata	mikimiki	1,2,3 ~ ❑ †	
Coprosma propinqua	**mikimiki**	1,2,3,4 ~ ❑ †	
Coprosma repens	**taupata (not local)**	1,3 ~	FT
Coprosma rigida	**mikimiki**	1,2,3 ~ ❑ †	
Coprosma robusta	**karamu**	1,2,3 ~ ❑	
Coprosma rubra	mikimiki	1,2,3 ~ ❑	
Coprosma virescens	**green mikimiki**	1,2,3,4 ~ ❑ †	
Coprosma wallii	mikimiki	1,2,3 ~ ❑ †	
Cordyline australis	**cabbage tree, ti kouka**	1,2,3,4 †	
Corokia cotoneaster	**korokio**	1,2,3,4 ~ ❑ †	
Dacrycarpus dacrydioides	kahikatea	1,2,3 †	
Discaria toumatou	matagouri	1,3,4 ~ †	
Dodonaea viscosa	**akeake (green form)**	1,3 ~ †	FT
Elaeocarpus hookerianus	pokaka	1,2,3 †	
Fuchsia xcolensoi	bush fuchsia	1,2 ❑	FT
Griselinia littoralis	**broadleaf, papaumu**	1,2,3,4 ~	
Hebe salicifolia	**koromiko**	1,2,3,4 ~ ❑	
Helichrysum lanceolatum	niniao	3,4 ~ †	
Hoheria angustifolia	**narrow-leaved lacebark**	1,2,3 ~ †	
Hoheria populnea	**lacebark, houhere (Sth Island form)**	1,2,3 ~ †	
Kunzea ericoides	**kanuka**	1,2,3,4 †	
Leptospermum scoparium	manuka (subject to blight)	3,4 †	

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drought tender	needs full sun	coastal tolerant	needs shelter	growth form	wildlife value
DT			S	small tree	berries
	O			dense shrub	berries
DT	O			dense shrub	berries
	O	C		dense shrub	blue berries
	O	C		small tree	berries
	O			dense shrub	berries
		C		small tree	berries
DT	O			open shrub	berries
	O			dense shrub	berries
DT	O			dense shrub	berries
	O	C		medium tree	white berries
	O			dense shrub	berries
DT			S	tall tree	berries
	O	C		open shrub	nectar/pollen
	O	C		medium tree	dry
DT			S	tall tree	berries
DT	O		S	dense deciduous shrub	berries/nectar
		C		medium tree	berries
DT	O			dense shrub	nectar
	O	C		dense shrub	nectar
	O			medium tree	nectar
	O			medium tree	nectar
	O			medium tree	nectar
	O	C		small tree	nectar

to P18 ☞

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DT The most drought tender spp in Canterbury context; needing moist soils.

O Needs full sun or at most only partial shade.

C Tolerant of salt spray and coastal exposure.

S Needs some shelter from strong drying wind and frost; interplant for diversity and wildlife.

Wildlife value is the main value of fruits or flowers for birds & lizards. *"Berries"* is a general term for fleshy fruits eaten by birds and lizards - especially blue fruits in latter case. Most dry fruits are nevertheless associated with flowers that are visited by insects for pollen or nectar.

Formal plant name	common name	suitable zone	frost tender
Lophomyrtus obcordata	rohutu	1,2,3✂❑†	FT
Melicytus ramiflorus	mahoe	1,2✂❑	FT
Metrosideros umbellata	southern rata	2✂	
Muehlenbeckia astonii	**shrub pohuehue**	1,2,3✂❑†	
Muehlenbeckia complexa	**scrambling pohuehue**	1,2,3,4✂❑†	
Myoporum laetum	**ngaio**	1,3✂†	FT
Myrsine australis	mapou, red matipo	1,2✂❑†	FT
Nothofagus fusca	red beech	1,2,3✂†	
Nothofagus solandri	black/mountain beech	1,2,3,4✂†	
Olearia bullata	shrub daisy	1,2,3,4✂❑	
Olearia "dartonii"	**shrub daisy (not local)**	1,2,3✂❑†	
Olearia fragrantissima	**scented tree daisy**	1,2,3✂†	
Olearia hectori	shrub daisy (not local)	4✂❑	
Olearia lineata	shrub daisy	2,3,4✂❑	
Olearia odorata	shrub daisy	3,4✂	
Olearia paniculata	**golden akeake**	1,2,3✂†	
Olearia solandri	coastal shrub daisy (not local)	1,3✂†	
Olearia traversii	Chatham Island akeake (not local)	1,3✂❑†	
Olearia virgata	shrub daisy	1,2,3,4✂	
Ozothamnus leptophylla	**tauhinu**	3,4✂†	
Pennantia corymbosa	kaikomako	1,2,3†	FT
Pittosporum crassifolium	karo (not local) & *P. ralphii* (not local)	1,2,3✂†	FT
Pittosporum eugenioides	**lemonwood, tarata**	1,2,3✂†	FT
Pittosporum tenuifolium	**kohuhu, black matipo**	1,2,3,4✂†	
Plagianthus divaricatus	**marsh ribbonwood**	1,3✂❑†	

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3 Plains

4 High country

✂ Able to be trimmed or hedged.

❑ Suitable for low hedges in centre-pivot irrigation (CPI) systems.

† Tolerant of some browsing pressure *once established*.

Bold names are robust & vigorous spp in Canterbury in the context of their stated preferences

drought tender	needs full sun	coastal tolerant	needs shelter	growth form	wildlife value
DT			S	small tree	berries
			S	small tree	blue berries
DT	O		S	medium tree	nectar
	O	C		dense deciduous shrub	white berries
	O	C		dense shrub	white berries
	O	C		small tree*	berries
DT		C	S	small tree	purple berries
DT	O		S	tall tree	dry
DT	O		S	tall tree	honey dew
	O			open shrub	nectar
	O			small tree	nectar
DT	O	C		small deciduous tree	nectar
	O			open deciduous shrub	nectar
	O			open shrub	nectar
	O			open shrub	nectar
	O	C		small tree	nectar
	O	C		dense shrub	nectar
	O	C		small tree	nectar
	O			open deciduous shrub	nectar
	O	C		dense shrub	nectar
DT			S	small tree	berries
	O	C		small tree	resin
DT			S	medium tree	resin
		C		medium tree	resin
	O	C		dense shrub	dry

FT The most frost tender spp in Canterbury context (usually absent from zones 3 & 4 unless there is full overhead shelter).

DT The most drought tender spp in Canterbury context; needing moist soils.

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* leaves may be poisonous to stock.

Formal plant name	common name	suitable zone	frost tender
Plagianthis regius	**lowland ribbonwood, manatu**	1,2,3 †	
Podocarpus acutifolius	sharp-leaved totara (not local)	3 ✂ ❑ †	
Podocarpus totara/hallii	**totara/mountain totara**	1,2,3,4 ✂ †	
Pseudopanax arboreus	five-finger, whauwhaupaku	1,2	FT
Pseudopanax crassifolius	lancewood, horoeka	1,2,3	
Pseudopanax ferox	fierce lancewood	1,2,3	
Rubus cissoides	bush lawyer, tataramoa	1,2,3 ✂ ❑ †	
Rubus schmidelioides	bush lawyer, tataramoa	1,2,3,4 ✂ ❑ †	
Schefflera digitata	patete, seven-finger	1,2	FT
Solanum laciniatum	**poroporo (short-lived nursery sp.)**	1,2,3 ✂ †	FT
Sophora microphylla	**kowhai**	1,2,3,4	
Sophora prostrata	prostrate kowhai	3,4 ✂ †	
Tecuridium parvifolium	NZ verbena shrub	1,2,3 ✂ ❑	
Tussocks & ferns			
Anemanthele lessoniana	wind grass	1,2,3 †	
Astelia fragrans	bush lily, kakaha	1,2,3 ❑	FT
Carex comans	sedge tussock	3,4 †	
Chionochloa rigida/rubra	snowgrass & red tussock	2,4 ❑ †	
Cortaderia richardii	**toetoe**	1,2,3,4 ❑	
Phormium tenax	**NZ flax, harakeke**	1,2,3,4 ❑ †	
Poa cita	silver tussock	1,2,3,4 †	
Polystichum richardii	shield fern	1,2,3 ❑	FT
Pteridium esculentum	bracken fern	1,2,3,4 ✂ ❑ †	

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drought tender	needs full sun	coastal tolerant	needs shelter	growth form	wildlife value
	O	C		medium deciduous tree	dry
	O			small tree	berries
			S	tall tree	berries
DT		C	S	small tree	purple berries
			S	medium tree	berries
	O			small tree	berries
DT			S	vine	berries
				vine	berries
DT			S	small tree	berries
	O	C		small tree*	berries*
	O			medium deciduous tree	nectar
	O	C		dense shrub	nectar
DT	O		S	open shrub	nectar
DT			S	medium tussock	grain
DT			S	tall tussock	berries
	O	C		short tussock	grain
	O			tall tussock	grain
	O	C		tall tussock	grain
	O	C		tall tussock	nectar
	O	C		short tussock	grain
			S	tussock fern	dry
	O			open fern	dry

FT The most frost tender spp in Canterbury context (usually absent from zones 3 & 4 unless there is full overhead shelter).

DT The most drought tender spp in Canterbury context; needing moist soils.

O Needs full sun or at most only partial shade.

C Tolerant of salt spray and coastal exposure.

S Needs some shelter from strong drying wind and frost; interplant for diversity and wildlife.

Wildlife value is the main value of fruits or flowers for birds & lizards. *"Berries"* is a general term for fleshy fruits eaten by birds and lizards - especially blue fruits in latter case. Most dry fruits are nevertheless associated with flowers that are visited by insects for pollen or nectar.

* leaves and green berries may be poisonous to stock.

Save the roadside and streambank remnants first

An ounce of protection is worth a ton of restoration. These remnants are the models and seed sources for recovery; they are micro-ecosystems complete with their soils, microbes and native soil fauna. We can't afford to lose them.

A locally rare small-leaved coprosma (C. intertexta), mid Canterbury

Some of the last silver tussocks on the Plains, SH1 south of Chertsey

These kanuka remnants at Maronan make fine natural shelter

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