

LAND MANAGEMENT

NATIVE TREES

New Zealand Native Plants for Erosion Control

Introduction

This Environment Topic provides information about the types of native trees, shrubs and grasses you can successfully to plant in an eroding area.

Why use native plants for erosion control?

The increased use of native plants for erosion control has resulted from interest in the conservation of native vegetation and the habitats they form.

Using indigenous plants enhances the aesthetic and ecological integrity of the vegetation, and results in long term protection when compared to that provided by many exotic species.

Native plants have evolved over centuries, and are well adapted to the soil and climatic conditions of New Zealand.

Unfortunately not many of New Zealand's species can be regarded as efficient colonisers. Generally our slow growing native vegetation will develop on bare or disturbed sites through a series of stages, or natural succession.

Native plants being used for the dual purpose of erosion control and protecting the margin of existing native bush.



Succession often begins with lichens, mosses and small herbs, progressing as soil and fertility builds, through hardy shrubs and small trees, to taller trees, and eventually, as protection and shade develops, to canopy species.

By careful planning and species selection, and by controlling weeds and exotics, which will also colonise bare and disturbed sites, it is possible to imitate this natural succession, and over time establish a permanent native plant cover.

Species selection will depend on both the type and severity of the actual or potential erosion, and the characteristics of the site, especially the local climate. An indication of likely species can be gained by checking the species content of local areas of bush.

Native seedlings being grown on a Hawke's Bay farm for planting out onto an eroding site.



New Zealand Plants Suitable For Soil Erosion Control

Many of these plants are also suitable for general revegetation, and for restoration of disturbed or depleted sites before erosion begins. A glossary of the symbols and abbreviations used is at the end of this table.

Botanical Name	Maori Name	Common Name	Type of erosion to control	Succession Status	Growth form and height	Tolerance to salt spray	Tolerance to wind	Tolerance to drought	Tolerance to frost	Tolerance to waterlogging
<i>Alectryon excelsus</i>	titoki	titoki	M	S2	ST 8m	mod	mod	mod	mod	mod
<i>Aristolelia serrata</i>	makomako	wineberry	ShR (SC) G	S1	ST 9m	low	mod	low	high	mod
<i>Brachyglottis repanda</i>	rangiora	rangiora	ShR W (SB)	S1 S2	sST 7m	mod	mod	mod	mod	low
<i>Carmichaelia species</i>		native broom	ShR	PS1	S 2m	low	low-high	mod-high	high	low
<i>Cassinia fulvida</i>	tauhinu	golden cottonwood	ShR Wc (G) sand dunes	PS1	S 2m	mod	mod	high	high	high
<i>Cassinia leptophylla</i>	tauhinu	cottonwood	ShR (G)	P S1	S 5m	mod	mod	high	mod	low
<i>Cassinia vauvilliersitt</i>	tauhinu	mountain cottonwood	ShR (G)	S1 S2	S 2m	mod	mod	mod	high	low
<i>Coprosma acerosa</i>		sand coprosma	ShR W dunes	S1	P S 2m	mod	mod	mod	mod	high
<i>Coprosma lucida</i>	karamu		ShR	S2L	ST 6m	mod	mod	low	mod	mod
<i>Coprosma parvifolia</i>		leafy coprosma	ShR	S1S2	ST 5m	low	mod	mod	high	low
<i>Coprosma propinqua</i>	mingimingi		ShR	S1S2	ST 7m	low	mod	mod	high	mod
<i>Coprosma repens</i>	taupata		Wc ShR	S1 S2	ST 8m	high	high	mod	mod	low
<i>Coprosma robusta</i>	karamu		ShR W	S1 S2	ST 6m	mod	mod	mod	mod	mod
<i>Cordyline australis</i>	ti kouka	cabbage tree	W M G	S2 L	T 5-13m	mod	high	mod	high	high
<i>Coriaria arborea</i>	tutu		ShR G	P S1	S 6m	low	mod	mod	mod	low
<i>Coriaria plumosa</i>	mountain tutu		ShR	S1	PS 0.5m	low	mod	low	mod	low
<i>Coriaria sarmentosa</i>	mountain tutu		ShR	S1	S 1m	low	mod	low	mod	low
<i>Corokia cotoneaster</i>	korokio		W ShR G	S1 S2	ds 3m	mod	high	mod	high	low
<i>Coryncarpus laevigatus</i>	karaka		Wc	S2L	T 16m	high	high	mod	low	low
<i>Dacrydium dactyloides</i>	kahikatea	white pine	W M	S1 S2	T 25-50m	low	mod	mod	mod	high
<i>Dodonea viscosa</i>	ake ake		Wc ShR G sand dunes	S1 S2 L	sST 7m	high	high	high	mod	low
<i>Fuchsia excorticata</i>	kotukutuku		ShR W Sc	S1 S2	sT 12m	low	mod	low	mod	mod
<i>Hebe odora</i>		boxwood	ShR	S1S2	sS 1-2m	low	high	low	high	mod
<i>Hebe stricta</i>	koromiko		ShR	P S1 S2	sS 4m	mod	mod	mod	mod	low
<i>Hoheria angustifolia</i>	houhere	lacebark	W ShR	S2 L	T 10m	low	mod	low	mod	mod
<i>Hoheria populnea</i>		lacebark	W ShR	S1 S2	T 10m	low	mod	mod	mod	mod
<i>Hoheria sexstylosa</i>		lacebark	W ShR	S2	ST 8m	low	mod	mod	mod	mod
<i>Knightia excelsa</i>	rewarewa	NZ honey-suckle	W	S2L	T 20-30m	low	mod	mod	mod	low
<i>Kunzia ericoides</i>	kanuka	white teatree	ShR G W	P S1 S2	ST 15m	low	mod	high	high	mod
<i>Leptospermum scoparium</i>	manuka	red teatree	ShR G W	P S1 S2	s TM	mod	mod	high	high	high
<i>Melicactus ramiflorus</i>	mahoe	whitey-wood	ShR G	S2	sT 10m	low	mod	mod	mod	mod
<i>Metrosideros robusta</i>	rata	northern rata	Wc ShR	S2 L	sT 15-25m	low	mod	mod	mod	low
<i>Metrosideros umbellata</i>	rata	southern rata	ShR	S2L	sT 15m	high	high	low	mod	low
<i>Myoporum laetum</i>	ngaio		Wc ShR	S2 L	ST 10m	high	high	mod	mod	low
<i>Nothofagus fusca</i>	tawhairau-nui	red beech	WShR	S2L	T 25-30m	low	mod	mod	high	mod
<i>Nothofagus menziesii</i>	tawhai	silver beech	ShR	S2L	sT 20-30m	low	mod	mod	high	mod
<i>Nothofagus solandri var solandri</i>	tawhairau-riki	black beech	ShR	S2L	T 25m	low	high	high	high	mod
<i>Nothofagus solandri var cliffortioides</i>	tawhairau-riki	mountain beech	ShR	S2L	sT 15m	low	mod	high	high	mod
<i>Olearia paniculata</i>	akiraho		Wc	S1S2	ST 7m	high	mod	mod	high	low
<i>Pittosporum colensoi</i>	rautawhiri	black mapou	ShR W	S1S2	ST 10m	low	mod	mod	high	mod
<i>Pittosporum eugeniioides</i>	tarata	lemonwood	W ShR	S1S2	ST 12m	low	mod	low	mod	mod
<i>Pittosporum ralphii</i>	karo	Ralph's kohuhu	WcShR	S1S2	ST 6m	high	high	mod	mod	low
<i>Pittosporum tenuifolium</i>	kohuhu		ShR	S1S2	ST 10m	low	mod	mod	high	low
<i>Plagianthus betulinus</i>	manatu	ribbonwood	W	S2L	sT 10-15m	low	mod	mod	mod	mod
<i>Plagianthus divaricatus</i>	makaka	shore ribbonwood	Wc estuarine	S1S2	S 2m	high	high	mod	mod	high saline
<i>Podocarpus totara</i>	totara		W ShR	S1S2 L	T 10-30m	low	mod	mod	high	mod
<i>Podocarpus hallii</i>		Hall's totara	W ShR	S2 L	T 10-20m	low	mod	high	high	mod
<i>Pseudopanax arboreus</i>	puahou	five-finger	ShR W	S1S2	ST 8m	low	mod	mod	mod	low
<i>Schefflera digitata</i>	pate		ShR	S1S2 L	S 8m	low	low	low	mod	mod
<i>Senecio bidwillii</i>			ShR	S1S2	S 1m	low	high	low	high	mod
<i>Senecio elaeagnifolius</i>			ShR	S1S2	sS 3m	low	mod	mod	high	mod
<i>Sophora microphylla</i>	kowhai		ShR Sb W	S2L	dT 10m	low	mod	mod	high	mod
<i>Sophora tetraptera</i>		North Island kowhai	ShR Sb W	S2L	T 12m	low	mod	mod	high	low
<i>Weinmannia racemosa</i>	kamahi		ShR Wc	S1S2L	sT 25m	low	mod	mod	mod	mod
Grasses & Herbs										
<i>Acaena spp</i>	piripiri	bidibidi	ShR	S1	Hc 0.2m	low	mod	low	mod	low-mod
<i>Cortaderia spp</i>	toetoe		ShR Wc Sb G	P S1 S2	Gt 2.5m	mod	high	mod	mod	mod
<i>Phormium tenax</i>	harakeke	flax	Wc ShR G Sb	S1 S2 L	Ht 2-3m	high	high	mod	high	high

Glossary of Symbols

Erosion Type

ShR sheet and rill erosion

W wind erosion

c species especially suited to coastal situations

Sc scree creep, mostly in mountain lands

M mass movement, including slips, slumps, and flows; most species listed under ShR can help prevent mass movement, but few can be used on active mass movements or highly unstable surfaces.

G gully erosion

Sb streambank erosion

Successional Status

P pioneer or colonizing species, for planting on bare, often infertile soils or subsoils

S1 a colonizing species suited to stabilized surfaces, often requiring extra fertiliser on infertile soils. Suited to planting on slip faces or earthworks and useful as a nurse crop.

S2 successional species requiring better soil and some shelter, but will provide shelter for other species once established.

L later successional species, used to complete the landscape effect and, being long lived, to provide long-term shelter and stability.

Growth Form

S shrub

T tree - forms a distinct trunk, though sometimes short

ST shrub or small tree

G grass or sedge

H herbaceous plant

p prostrate or low growing

s spreading or forming a wide canopy
divaricating, often only in juvenile stage

t tussock forming

c mat or creeping

Environmental Tolerances (may vary within species and time of year. Tolerances depend on growth stage, and adaptation or acclimatisation to a particular environment)

1. *Salt Spray (wind borne)*

- low - little or no capacity to withstand salt on leaves
- moderate - tolerates some salt but will lose vigour rapidly with heavy or frequent deposits
- high - tolerates salt laden winds and salt spray, and some salt in ground water

2. *Wind*

- low - will be damaged by high winds
- moderate - will tolerate strong winds with only minor damage, but will not grow well in persistent prevailing winds
- high - will tolerate strong to gale force winds with little, or no damage, but drought susceptible species will do poorly in hot, dry winds.

3. *Drought*

- low - may withstand a day or two of mild moisture stress, but will rapidly lose vigour, or suffer permanent damage under longer periods of moisture stress.
- moderate - can withstand seasonal droughts provided soil moisture levels do not fall below wilting point for several weeks or more.
- high - can withstand prolonged seasonal drought, and in some cases semi-arid conditions.

4. *Frost tolerance (winter maximum)*

- low - generally tender and will be damaged by cold winds or frost of -2°C or -3°C
- moderate - will tolerate frosts of -3°C to -6°C
- high - generally considered as frost hardy in most lowland and lower mountain districts and will tolerate frost temperatures of -7°C or lower.

5. *Waterlogging*

- low - will not tolerate roots being in waterlogged soil for more than several days in succession
- moderate - will withstand frequent waterlogging, but not continual waterlogging for long periods
- high - can withstand roots continually in wet or waterlogged soil; growth may be slower, but otherwise plants will not be affected.

For further information

For further information ask for the other titles in this series or contact Land Management Officers at the Hawke's Bay Regional Council for advice:

Wairoa 06 838 8527

Napier 06 835 9200

Waipukurau 06 858 8636

TOLL FREE 0800 108 838

www.hbrc.govt.nz