

Soil Conservation Practice MULTI-PURPOSE EXOTIC TREE SPECIES

Introduction

Trees are assets in the rural landscape. They provide conservation and ecological benefits, as well as contributing to aesthetic values. Besides amenity uses, exotic trees can also provide shade or fodder for livestock, timber or firewood, shelter and erosion control.

Selecting Species

Species can be selected to perform specific functions (e.g. shelter) or for multiple uses (e.g. erosion control and animal fodder). Exotic trees should also be chosen with regard to site limitations (e.g. frost tolerance) or management factors (e.g. proximity to drains or power lines).

Availability of plant stock and establishment factors (e.g. protection from livestock) should also be considered. Local experience is often helpful, so consult neighbours, local tree nurseries and members of the Farm Forestry Association or the Tree Crops Association.

A number of multipurpose species are listed overleaf. This list is by no means exhaustive and does not include fruit/nut-bearing species. For more information see *Trees in the NZ Countryside* by John and Bunny Mortimer, or *Woodlots in the Landscape* by Diane Lucas

Establishment Factors

Good weed control is vital for plant establishment. For information on weed control, fertilisers and planting techniques see *Sustainable Options SC 15/98* Establishment Techniques for Revegetation Projects. Poplar and willow cultivars can be established directly from 3m long poles, with a large end diameter of 75-80mm. Planting technique for this sort of material is described in *Sustainable Options SC21/98* Uses and Management of Willow Species.

Tree Protection

Trees require protection from grazing livestock. Woodlots, shelterbelts or coppice blocks are easily fenced off. For specimen or individual trees planted in paddocks, single tree protectors are required. The protector type will be largely determined by the type

of livestock present. All protector types should be monitored regularly to ensure they are working properly, and that they are removed before being enveloped by the tree.

Sheep

For seedling plant stock, the options are a cage type protector or a tree shelter type protector. Tree shelter types are translucent plastic tubes which provide an enhanced growing environment. Growth rates are usually faster in tree shelter protectors, although with some tree species there is a higher risk of disease or insect attack. Cage type protectors can be constructed with Treegard® netting sleeves erected on a frame, or formed into a tube shape with sections of plastic drainage pipe. If using drainage pipe, remove it before trees get too big.



Remove plastic drainage pipe before trees are damaged

Sapling stock (rooted trees 2–3m high) can be protected from sheep grazing by a Treegard® sleeve, tied down to rubbing stakes either side of the tree. Fence battens (50 x 50mm) are suitable for rubbing stakes, and should extend at least 60cm above ground level. The Treegard® sleeve protects against grazing while the rubbing stakes take the force of animals attempting to scratch themselves.

Multipurpose Exotic Tree Species

Species	Habit				Tolerance					Erosion Control			Other Uses	Comments
	Leaf	Form	Height	Growth	Wind	Salt Wind	Dry Soil	Frost	Wet Soil	Slip	Gully	Stream-bank		
<i>Acacia dealbata</i> Silver Wattle	E	S	10-20	F	**	*	***	**		**	***	*	Firewood, timber, bee fodder	N-fixer, coppices and will sucker from damaged roots. Invasive species, requires careful management.
<i>Acacia melanoxylon</i> Tasmanian Blackwood	E	S	15-30	M	**		**	**	*	**	***	**	Timber, firewood, bee fodder	N-fixer, coppices, prefers moist fertile acidic soils.
<i>Alnus cordata</i> Italian Alder	D	S	15-20	M	**		**	**	*	*	*	*	Windbreaks, firewood, timber	N-fixer, coppices. Timber is durable under water
<i>Alnus glutinosa</i> Black Alder	D	S	15-20	M	**	*	*	***	***	*	**	**	Windbreaks, firewood, timber	N-fixer, coppices, deep rooting with minimal spread. Timber is durable under water.
<i>Casuarina cunninghamiana</i> River Sheoak	E	S	15-20	M	**	*	**	*		*	*	*	Windbreaks, fodder, firewood	Crown opens out unless regularly trimmed. Tolerates heavy soils but not waterlogging.
<i>Chamaecytisus palmensis</i> Tagasaste/Tree lucerne	E	S	4-6	M	**	**	**	**		*	***		Windbreaks, bee/stock fodder, firewood, nurse crop	N-fixer, coppices. Seedlings are frost tender and highly palatable to rabbits
<i>Cryptomeria japonica</i> Japanese Cedar	E	N/S	15-20	M	**			*			*		Windbreaks, amenity, timber	Tolerates partial shade and competition from other trees.
<i>Eucalyptus leucoxylon</i> var. 'rosea' Yellow gum	E	S	15-20	M	**		**	**		*	*		Windbreaks, amenity, bee fodder (plus native birds), timber	Prefers moderately fertile soils, produces ground durable timber.
<i>Eucalyptus pulchella</i> White Peppermint Gum	E	S	10-20	M	***		***	**		**	*		Windbreaks, beefodder, amenity	Coppices and tolerates light textured droughty soils. Produces ground durable timber.

<i>Gleditsia triacanthos</i> Honey Locust	E	S	25-40	M	**		*	**		*	*		Fodder, amenity	Grafted plants and good sites are required for good crops of (fodder) seed pods.
<i>Larix decidua</i> European Larch	D	N/S	20-25	M	**		**	***	*	*	*		Windbreaks, timber, amenity	Bright autumn colour, unsuitable for sites within frost ponding or high exposure.
<i>Plantanus orientalis</i> Oriental Plane	D	N	20-30	F	***	**	*	***	**	**	**	*	Windbreaks, timber, amenity	Suitable for pollarding, palatable to livestock.
<i>Populus alba</i> , ' <i>Pyramidalis</i> ' Upright Silver Poplar	D	N	20-30	F	***	**	*	***	**	**	**	*	Windbreaks, timber, amenity	Best establishment with rooted material, tolerates moderately saline soils. Male clone.
<i>Pseudotsuga menziesii</i> Douglas Fir	E	S	20-40	M	**			***	*	*	**		Windbreaks, timber, amenity	Best for cool inland areas. Requires moist well drained soils. Ready market for timber.
<i>Quercus palustris</i> Pin Oak	D	S	15-20	S	**		*	**	**	*	*		Windbreaks, amenity	Will not tolerate severe exposure.
<i>Robinia pseudoacacia</i> Black Locust	D	S	15-20	M	*	*	**	***		*	***		Timber, firewood, amenity	N-fixer, produces ground durable timber, suckering habit.
<i>Salix matsudana</i> Peking Willow	D	S	15-20	F	**	*	*	***	***	***	***	*	Windbreaks, bee fodder, firewood, amenity	Can be pollarded for stock fodder.
<i>Salix matsudana x alba</i> ' <i>Tangoio</i> ' 'Tangoio Willow'	D	N/S	15-20	F	**		**	***	***	***	***	*	Windbreaks, fodder, amenity	Best establishment with rooted material on dry sites, responds well to pollarding/coppicing.
<i>Taxodium distichum</i> Swamp Cypress	D	N	20-30	M	**		*	**	***	*	**	***	Timber, amenity	Will grow on water logged sites.

Key

Leaf: E = Evergreen D = Deciduous	Form: N = Narrow S = Spreading	Growth: F = Fast M = Medium S = Slow	Tolerance: * = Low ** = Medium *** = High	Erosion Control (suitability) * = Moderate ** = Good *** = High
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Sapling protected with Treegard® sleeve and rubbing stakes

Cattle

More extensive protection is required for cattle. Post and rail enclosures are one option, providing the enclosure is at least 4 x 4m square. Corner posts should be reasonably substantial (2.1m No. 3 rounds) and 150 x 50mm rails are recommended.



A three-ring electrified protector

Another option is to use a three ring electrified protector, constructed from two insulated posts and sections of fencing wire. Insulated posts can be made from 1.5m lengths of 15mm PVC pipe. The top ring of the protector forms a 1000mm diameter at 1.2m above ground level.

Goats

The three ring electrified protector is also suitable for protecting trees from goats. For non-electrified protection, sleeves or structures at least 1.7m high (preferably higher) will be required. For sapling or (poplar/willow) pole material, a Dynex® pole sleeve is recommended. Sapling material will generally not be capable of supporting the sleeve, which will require staking.

Deer and Horses

These animals are the most difficult to deal with when protecting young trees. Enclosures made with deer fence posts and netting are the most reliable, and should be at least 3 x 3m square. Lighter posts of the same length (at least 3m) can be used, provided they are braced with a top rail. Enclosures should be at least 2m high. To save on materials costs, such enclosures can be built adjoining existing deer fences. Because these enclosures restrict access for tending, they are better suited to sapling (versus seedling) plant stock.

Management Factors

Multipurpose species being used for stock fodder or firewood purposes can be managed in either a coppice system or a pollarding system. Coppicing involves cutting stems near ground level, and is best managed in purpose-planted blocks at densities of 5,000-10,000 trees per hectare. Fodder blocks can be grazed directly, or on a 'cut and carry' basis if operating on a small scale.

Pollarding is the cutting off of the tree crown (branches and leaders) above the reach of livestock. This is a useful method of harvesting emergency stock fodder from suitable species (e.g. 'Tangoio' willow) and is best done on a one to two year cycle to stimulate growth.

Routine pruning is another way to derive material for stock fodder. This may be applied to improve tree form for forestry or amenity purposes, or may be regular side trimming in the case of certain shelter species. All pruning (pollarding, etc) operations are best carried out during the dry settled conditions of late summer/early autumn to avoid the possibility of disease entering pruning wounds.

For more information and advice contact your local Soil Conservator at the following Environment B·O·P offices:

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