Info 20: SHELTER BELTS

GENERAL INFORMATION
There are several very good reasons for growing shelter belts around your property.

- Shelter and protection for humans, livestock, crops and pasture.
- Shade
- Financial gain for timber
- Protection against wind generated soil erosion
- Foster wildlife
- Beautification
- Capital Improvement

The most obvious effect of shelter trees is the reduction of wind velocity on the leeward side. The area protected by a windbreak is related to the height of the trees and the permeability of the belt. Belts with 50% permeability will reduce the wind velocity for a greater distance than a nil permeability belt. Very dense shelter belts provide maximum protection nearby, but they create turbulence which limits the sheltered area. A good shelter belt will reduce wind speed as far as 20 times the height of the trees to leeward, and 5 times the height of the trees to windward.

Short shelter belts are inefficient. To provide the maximum amount of shelter, a belt should be longer than 12 x the height of the mature trees.

Orientation of the belts should be at right angles to the most damaging winds.

Two or three row belts are recommended as single rows of shelter are vulnerable to wind tunneling through the gap if one tree dies.

Shelter belts can be made visually pleasing by using different species for each or within rows. Multi row belts provide great flexibility in terms of planting regimes to
match budgets and provide a wider variety of end uses eg. Shelter, timber, rotational coppicing for fuelwood, lambing, calving and storm protection etc.

For best results when planting a shelter belt, it is advisable to spray or short graze the area prior to planting, then rip an area approximately 70 – 80 cms deep. Plant in June, July, August, planting approximately 150 cms of the tree in the ground. This will prevent the tree from socketing- damaging the roots with the movement of the wind. It can also make the tree lop-sided. In August or September spray the whole area including the tree with Terbuthylazine 500 (or similar) to kill the weeds and grass. This will not affect the trees.

OPTIONS FOR SHELTER BELTS…

Abies
Abies Pinsapo (Spanish fir) is a slow but tough grower for a shelter belt. It is cold-hardy and will tolerate most soil conditions except boggy areas. It has short stubby needles and is an attractive tree.

Abies Religosa (Mexican fir) is a compact upright conifer with silvery green foliage. It suits dry areas and is reasonably cold-hardy.

Abies Verjari (Silver fir) is a Mexican evergreen fir that is cold-hardy. It is a narrow conical, vigorously growing tree.

Acacia (Wattles)
These are very large evergreen trees prized for their attractive foliage and for the abundance of golden yellow blossoms. Acacias are quick growing and most of them will survive in poor dry soils. Their wood makes excellent firewood.

Alders
These are hardy, deciduous trees that will usually grow in moist or wet soils, although some will also grow well on higher drier land. However DO NOT plant them close to waterways as the seed will spread downstream and the resultant seedlings will ultimately become a nuisance. Their root nodules fix nitrogen at rates comparable to those of legumes such as clover. Alders are natural colonizers of disturbed and infertile sites. The decay of their roots and litter, which breaks down rapidly and is comparatively high in nutrients, enhances the fertility of the soil particularly with regard to available nitrogen compounds; by building up the organic fraction decay also improves soil structure. Most of the varieties are cold-hardy. The trees are rapid growers reaching 5m+ in five years.
Cedrus
Cedars are a long-living and handsome evergreen conifers growing to large size with spreading, horizontal branches. They can be used for various carpentry and cabinet purposes and also for ground-work. These trees grow best in deep loams, but any reasonable soil is suitable provided drainage is good. They are hardy mountain dwellers that can withstand severe winter conditions.

*Cupressus Macrocarpa* (Macrocarpa)
*Cupressus Macrocarpa* is very prone to canker, and is no longer recommended as a cost-effective shelterbelt option. A tree to use instead is *Cupressus torulosa*. This is more tolerant of canker. It is a strong upright conifer, well-suited for a shelter belt, especially on dry sites. Quite golden in colour, it has a conical form.

*Cupressus leylandii* (Leyland Cypress)
Leyland Cypress varieties are very popular for a shelter belt. They come in many forms: Leighton Green is fast growing with large lower branches. Stapehill is a good substitute for Leighton Green, it is a very vigorous growing tree, The colour and growth being very similar. Ferndown & Naylors Blue are more even branching, and a more open tree. Ferndown tends to be a little 'floppy' when young, but soon straightens up as it matures. Castlewellan Gold, Robinsons Gold and Gold Rider are the yellow-gold varieties of the leylands. Castlewellan has a slightly golden foliage, and is a little slower-growing. Robinsons Gold is a faster-growing Leyland, with a very gold tip. They make a beautiful show in Autumn but are also recognisable in other months. Haggerston Grey and Naylors Blue are more blue-grey in appearance. They are similar in growth to other leylands. *Cupressus leylandii* ‘Olive Green’ also has a slightly gold tip. Be aware that you will need to leave space beside your leyland shelterbelt for trimming. Fan pruning of the leylands is a good way of pruning shelter belts where space is an issue. Cut back the front and backs at the base of the tree right back to the trunk. The inside branches of the trees will grow into each other and fill the base area. Spacing for planting and growing leylands depends on the requirements of the land and owner. An average distance apart is 1.5 metres. In dryer conditions, plant trees closer together. Plant trees closer in a single row, further apart for double rows. Competition will stop trees growing. If the ground is too dry this will also stop the trees growing. Plant leylands in winter time when there is a higher rainfall and the ground is moist.

Eucalyptus (Gums)
Eucalyptus varieties are very good for a shelter belt. Most varieties have the added advantage of coppicing. They are rapid-growing upright trees, many growing up to 30m tall. The bark on some eucalyptus trees is very decorative in colour and texture, giving it a look of its own. Eucalyptus trees are good for timber posts and firewood. There are a few eucalyptus trees that grow smaller and are more ornamental. These grow to about 10m tall.
**Pinus radiata (Pine)**

*Pinus Radiata* is a very popular tree to plant for a shelter belt. They are very rapid-growing and prefer dry to moist conditions. *Pinus Radiata* has been subject to intensive research in NZ covering all aspects of its biology, silviculture, and utilisation. Radiata Pine has been progressively domesticated and genetically improved through tree breeding, resulting in commercial varieties that today grow faster and straighter, and that may also have finer branches, better resistance to diseases, and more dense wood. GF stands for Growth and Form. This is a rating applied to all Pinus Radiata seedlots in New Zealand. GF breeds are selected on performance characteristics in the forest such as wide adaptability, stem straightness, increased volume, and less malformation. The seed is taken from improved stands of trees, superior trees within these stands, or from the best tested parent trees in a control-pollinated orchard. GF19 variety pine trees are a good tree for a shelter belt. They are a good general purpose tree for shelter belts. GF+ is a higher grade of *Pinus Radiata*, its seedlings come from control pollinated parents. They have a higher growth and form, and are a better timber tree than GF19. GF+ are more expensive than GF19 and are probably better to be used in a good soil area. GF+ is a good pine to use for Xmas trees.

**Populus (Poplars)**

Poplars are one of the fastest-growing trees, mainly deciduous and mainly wind tolerant. They prefer sandy loams or silts and will make rapid growth if the conditions are right. They dislike heavy, stiff clay soils that do not allow a free root run, or soils with a very high stagnant water table. Poplar timber has many special uses because of its white colour, lack of smell and resins, workability, softness, light weight, relatively high strength in proportion to weight and its resistance to splintering. It can be used for farm gates and fencing, battens and farm yards. The foliage can be fed to cattle as a supplement. The correct time to prune poplars is in January or February. With its rust resistant clones available in NZ this makes it a popular tree to grow.

**Pseudotsuga Menziesii** (Douglas Fir, Oregon Pine)

This timber is highly prized for its’ strength and suitability for building and constructional work. It is not a ground-durable timber, the heartwood only having a life of 5-10 years and is not amenable to pressure treatment. It prefers deep, well-drained and reasonably good soils in areas of 1000-1500mm rainfall. The trees dislike wet or alkaline soils. It is very hardy and will withstand severe frost exposure except when very young. Warm climates are not favourable and are this tree is unlikely to do well in warmer areas. It will grow in higher altitudes, the South Island 1000m and the North Island 550m. This tree should not be planted in clay when grown alone because of a tendency to blow over in high winds. Sites selected for specimen trees should be those where the roots can go down freely and thus provide the stability necessary for anchorage.
**Salix (Willow)**
Willows are a hardy, deciduous tree. They are moisture-loving trees which are at their best in damp areas. However DO NOT plant willows on the banks of any water ways as the roots can eventually block the flow, and then require a major operation to extract them. All varieties can withstand heavy pruning. The prunings can be used as a stock fodder food in summer. Willow timber is straight-grained with fine, even texture and very tough. Willow is a strong, durable timber good for fencing and farm needs.

**Sequoia Varieties (Redwoods)**
Grown in ordered plantations in good, moist soils, the clean-barreled boles of these trees, even in young NZ stands, presents an impressive and imposing spectacle. Sequoia trees have a thick bark (up to 0.3m) that protects the tree from fire. The durable timber is easy to work, resists decay and insects and is used for many jobs where it is in contact with the ground (e.g rail sleepers and bridge timbers).

**Thuja Varieties**
These trees are shapely, symmetrical, evergreen conifers. They are very hardy and grow best in somewhat moist soils in areas of high rainfall. In drier parts they are inclined to appear stunted in growth. This timber is light in weight, soft and easily worked, but ground durable and of excellent milling quality. It is used for railway sleepers, telephone poles etc. They will grow in damp clay soils in areas of 1000mm or more of rainfall. It has a rather shallow and wide-spreading root system and is unlikely to thrive in low rainfall areas. It is shade-tolerant and can be trimmed. Heartwood content is high, durability is good and round material has been used for posts. These trees will grow more vigorously in cold areas.
LOW NATIVE SHELTER

Principle
Backbone of double meandering lines of hardy natives to provide efficient stock shelter
bird habitat and improved farm landscape.

Site Preparation
Pre-plant spot spray with Glyphosate e.g. ‘Roundup’ (addition of dye recommended).
Post-plant spray with ‘Versatill/Gallant’ as required, or Buster.

Establishment
Space plant September/October on frosty sites, or April/May on mild sites. Species
and spacings are a guide and may be adapted to perceived shelter needs.

Step 1:  Lower “bushy” component (12 plants per 20m)
Establish the ‘backbone’ plants at 1.8m spacing along a curved line

\[ \text{10 m} \]

E.g. Pittosporum species, Coprosma species, Olearia species,
Griselinia littoralis, Corokia species, Hebe salicifolia, H. Parviflora.

Step 2:  Taller component (8 plants per 20m)
Repeat the operation along an imaginary opposite line

\[ \text{10 m} \]

E.g. Plagianthus regius, Hoheria augustifolia, Sophora microphylla.

Step 3:  Supplementary component (6 plants per 20m)
Add a random mix of supplementary species as shown. For longer sites,
these extras should be located randomly to avoid symmetry. Please —
no equidistantly planted Kowhais hanging regularly over the fence every
10m!

Shade Tolerant
Pseudopanax arboreus,
Podocarpus totara

Light Demanding
Cordyline australis,
Kunzea ericoides,
Nothofagus solandri v. cliffortioides

Note:  Many plants are site-specific. Obtain advice on selection. Plant-material from local seed sources should be used.

NOTE:
Shelterbelts located under powerlines need to be limited in their height for safety reasons. Visit
http://www.oriongroup.co.nz/publications-and-disclosures/trees-and-power-lines.aspx for more
details on regulations and recommendations on planting in and around powerlines.

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