

LAND MANAGEMENT

SUSTAINABLE LAND

Shelter species for horticulture and cropping on the plains

Main Points

- There are many tree species which can provide effective shelter but choice will depend on site conditions, crop requirements, and personal preference.
- The species commonly used in intensive horticulture/cropping in the Hawke's Bay tend to respond well to side-trimming, have some drought and frost tolerance, are moderate to fast growing and can be planted as single row belts.
- Single row belts are best suited to this landuse to minimise land use and offer better wind filters.

What are the key factors in establishing a shelter belt?

Species commonly used as shelter in the intensive horticulture/cropping areas of Hawke's Bay tend to respond well to side-trimming, have some drought and frost tolerance, are moderate to fast growing and can be planted as single row belts.

Single row belts are best suited to this landuse as they minimise the land taken out of production and filter wind across an orchard or paddock rather than block it completely. A dense, solid barrier tends to create turbulence and accelerate wind speed.

The choice of species will depend on site conditions (e.g. wetness), crop requirements (e.g. evergreen species for year-round protection), and personal preference.

Characteristics of commonly used shelter species

Alder (*Alnus spp*)

Alders are deciduous, moderately fast growing, frost-hardy trees which display moderate tolerance towards dry conditions. They have a longer leaf retention than poplars and willows and grow to 15-20m if left untopped. The main advantage of alders over other shelter species is their ability to fix atmospheric nitrogen in the soil. This, combined with their deeper-rooting habit, results in far less competition on the adjacent crop for nutrients and moisture, and subsequent need for root pruning.

The recommended species for Hawke's Bay is the Italian Alder (*Alnus cordata*). It originates from Sicily where they have similar warm, dry summers and cool winters. Cordata tolerates dry conditions better and has a longer leaf retention than other alders. The Black Alder (*A. glutinosa*) tolerates less fertile soils and water-logging better, but can become too seedy. Plant as bare-rooted stock or in root trainers.



Alder shelter belt

Eucalyptus

Eucalyptus species are evergreen and there are more than 90 species. Many eucalyptus species will grow in the predominantly dry, Hawke's Bay climate but some eucalypts prefer wet, damp conditions and do not survive drought conditions even when mature.

Members of the peppermint group lend themselves to the shelter required on the plains. They have good growth rates, tolerate drought, are small leaved and do not grow too large if left untopped (some eucalyptus species can grow up to 90m!). Container-grown material is better than bare-rooted stock when planting on hard sites.

Recommended species include:

- *Eucalyptus amydalina* (Black peppermint), Grows to 15 to 25m with a moderate growth rate.
- *E. nicholii* (Narrow-leafed Black peppermint) - grows to 10-15m with a moderate to fast growth rate.
- *E. pulchella* (White peppermint) - grows to 10-20m with a moderate growth rate.

Eucalyptus roots can travel long distances, making regular root pruning necessary. The major pest is the Eucalyptus Tortoise Beetle which can severely defoliate the tree. Control rabbits and hares during establishment.



Natives

Native plants are part of our unique natural heritage. Although not commonly used, many species are suited to shelter planting. The following have moderate growth rates, some tolerance to dry and frosty conditions, hedge well and hold their foliage over winter. Combining tall and low growing species can create very attractive shelter. Plant as container grown or root-trainer material.

- *Dodonea viscosa* (Akeake) - small tree growing to 7m with red stringy bark.
- *Hoheria sextylosa* (Long-leaved Lacebark) - small tree growing to 6m with masses of white flowers.
- *Kunzea ericoides* (Kanuka) - small tree growing to 10m, aromatic with white flowers.
- Pittosporum species including *P. ralphii* (Karo) - grows to 4m with larger leaves and reddish-purple flowers.
- *P. tenuifolium* (Kohuhu) - grows to 9m with light green glossy leaves.
- *P. eugenioides* (Lemonwood) - grows to 12m with lemon-scented leaves.



Mixed Native Shelter Eucalyptus Shelter

Poplar (*Populus spp*)

Poplars are deciduous and provide fast growing, attractive shelter. They have moderate drought resistance, are frost hardy and will grow to 20-30m. Poplar roots travel long distances so regular root trimming is necessary.

Veronese, Tasman and Crows Nest are varieties which show good wind tolerance, making them suitable for shelter belt planting. Veronese is the most drought tolerant poplar available, while the other two show resistance to the Marssonina and Melampora Poplar Rusts. Crows Nest displays the erect Lombardy form. Each of these varieties flush a beautiful reddish-bronze colour and are palatable to possums. Plant as unrooted or bare-rooted material.



Poplar Shelter

She-Oak (*Casuarina spp*)

Casuarinas are evergreen and grow very well in drier conditions but do not tolerate wet soils. They trim up well and have light branching which filters wind rather than providing a thick, dense barrier. The light

branching is also said to discourage birds from nesting or landing in the trees.

Regular root trimming is required as the roots travel long distances and compete with adjacent crops. Plant as container grown material.

Casuarinas have moderate growth rates and will grow to 15-20m. They are frost tender when young and require good weed control during establishment. Leaf roller caterpillar does not pose a problem in contrast with other shelter species. However, casuarina are susceptible to phytophthora fungal infections.

C. cunninghamiana (River She-Oak) is the recommended species for the plains environment, but *C. glauca* (Swamp She-Oak) is a coastal species which can handle wet conditions better.



She-Oak (Casuarina)

Willow (*Salix spp*)

Willows provide deciduous, frost-hardy, fast-growing shelter and generally hold their leaves longer than poplars (in leaf from mid-August to late-May). Willows prefer moist soil conditions and will reach 15-25m in height. As with poplars, willows hedge well but require regular root pruning. Plant as unrooted or bare-rooted material.

Tangoio and Moutere are the two Matsudana willow hybrids identified as having superior shelter characteristics. Tangoio is the most drought tolerant of the tree willow species, whilst Moutere is

slightly faster growing. Both have good lower branch retention, are wind tolerant but like most tree willows are palatable to possums. Lemon Tree Borer and Leaf Sawfly will attack these species without ill effect.



Willow Shelter

Establishing Shelter Trees

- Erect a fence if stock damage is likely. A gap of a metre between the fence and tree row is enough if you side-trim regularly. An electric out-rigger will deter browsing stock.
- Install irrigation. We recommend irrigation during establishment, especially on lighter, free-draining soils. Trickle irrigation is particularly suited to shelter planting.
- Pre-plant spray 1m diameter spots with glyphosate several weeks before planting or alternately hand-grub. Soil residual herbicides, like those used for *Pinus radiata*, are toxic to some tree species. Check with an agrichemical representative before use.
- Pest control should be carried out before and after planting. Rabbits, hares and possums pose the main threat to young trees, although pukeko can be a problem if planting near swamps. If damage is noticed apply a repellent.

You can make your own pest repellent by mixing together five fresh eggs, 150ml acrylic paint and 600ml of water. Apply to the seedling with an old paint brush.

Planting

- Planting is best carried out during July-August, while sufficient moisture is still in the ground. Eucalyptus species should be planted once the risk of frost damage diminishes. The average date of the last spring frost for Hastings is 29 August.
- Trees can be planted by making a T-cut incision in the ground or by digging a spade-deep hole. Whichever method is used, ensure the soil is loosened so root growth will not be restricted but the tree is firm in the ground. Cut off any spiraling roots from plants in containers, and cut the bottom 3cm off roots of plants raised in root-trainers.
- For shelter belts which will be regularly side-trimmed, space seedlings at 1-2m apart.
- Where practical, place mulch around the seedling using bark, straw (not hay), polythene or newspaper. This helps conserve moisture, reduce weed growth and control soil temperatures.
- Follow up by maintaining a weed-free line for two years. Hand grub or spray with glyphosate around shielded plants as necessary.

For further information

For information on shelter design for horticulture and cropping, or boundary planting regulations ask for other titles in this series, or contact Land Management staff at Hawke's Bay Regional Council for advice.

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