

LAND MANAGEMENT

SUSTAINABLE LAND MANAGEMENT

Shelter for Hill Country Farms:

Part 3 Shelterbelt Establishment and Maintenance

Introduction

This Environment Topic discusses how to plant and manage shelterbelts. Careful establishment will promote good, even, growth rates and avoid tree losses leading to shelterbelt gaps.

The principles of planting are the same as for any on-farm planting. The aim is to achieve 100% survival of the trees you plant. To achieve this, carefully plan and manage your site preparation, planting techniques, tree stock quality, fertiliser requirements, release (weed) spraying, protection from animal damage, and if needed irrigation.

Other Environment Topics in this series cover shelter design (Part 1) and choosing your shelterbelt tree species (Part 2).

When to plant

The best time to plant depends on the location. If you are not sure, check with your neighbours or a member of the local



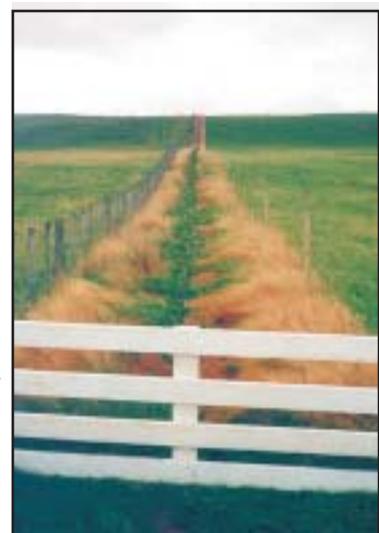
Stock damage by Fresian bulls to a shelterbelt of Pinus radiata.

Farm Forestry Association.

Usually the best time to plant is from May to August when the ground is moist. On sites where frost and waterlogging are not a problem, autumn planting is often very successful, especially if summer droughts are common. However, if you get heavy frosts, plant in spring (September-October) but only if soils remain moist in summer.

Preparing the site

Before fencing or planting, graze the site hard suppressing the pasture and other weeds. This will help with weed control spraying. Before fencing, the soil may need to be ripped if a pan or dense clay is present. Rotary hoeing or turning the soil for planting is an option for reducing chemical use. Access to the site and a water supply may also need to be installed.



Well fenced and good weed control of this two-year old Leyland cypress var. 'Leighton Green' shelterbelt. Photo: Simon Stokes

Fencing

You must fence out stock before planting. Fencing is essential to prevent plants being eaten.

The fence needs to be far enough away from the plants (1m for sheep, 2-3m for cattle) to prevent stock reaching over the fence and eating the plants. Successful planting has been achieved as close as 1.5m with an electric wire on top of the fence.

Weed control

Clear weeds and grass in circles of about 1m at each planting site, using either herbicide spray or a spade. When pre-plant spraying it is best to spray approximately six weeks before you intend to plant. Make sure you use herbicides at the recommended rates. If you use a residual herbicide, care is needed at planting to remove the sprayed soil.

The choice of herbicide will depend on the weeds. For normal pasture the most commonly used contact or knockdown herbicide is glyphosate. Ideally spray when the vegetation is 5-10cm in length as this gives the best control.

Spraying can be carried out with a knapsack sprayer or a with spot gun. Spot guns are the most useful for pre-plant spraying.

Applying mulch at planting can help avoid later weed problems. A thick layer of newspaper weighed down with clods, or a one metre square of carpet or non-synthetic underlay split to place around the plant, will make an effective mulch. Take care not to place organic mulch up against the stems as it can damage them.

For further information on identifying and controlling your plant pests, contact your Hawke's Bay Regional Council Biosecurity Plant Pest Officer or check the Environment Topic series on plant pests at www.hbrc.govt.nz.

Animal pest control

Animal pest control will be needed. Hares, rabbits and possums can be a particular problem for young plants so it pays to do some control before you plant. Individual tree protectors can be used for protection against hares and rabbits.

Pukeko can be quick to wreck plantings such as flax, by nibbling and uprooting. Planting bigger plants (40cm high) can deter them.

For further information on controlling your animal pests and on animal pest control product subsidies, contact your Hawke's Bay Regional Council Biosecurity Animal Pest Officer or check the Environment Topic series on animal pests www.hbrc.govt.nz.

Obtaining plants

The quality of the plants has a major effect on their survival, early growth rate, root system configuration and resistance to windthrow. For natives try to obtain plants from local seed sources (eco-sourcing). This helps to maintain locally adapted genetic strains and ensures that the plants are well suited to the local conditions.

Check plant quality before they leave the nursery, making sure the roots are moist, that there are plenty of fine fibrous roots and several thicker anchoring roots.



Good balance between roots and the foliage of these bare-rooted Cupressus lusitanica. Well prepared by the nursery for successful planting. Photo: Kevin Thomsen

Bare rooted plants must be planted within 48hrs and preferably the same day. Never order more bare rooted plants than you can comfortably plant in two days.

Plants should be 20-30cm tall. Smaller plants are more susceptible to frost, hare, rabbit and drought damage but do not take as long to recover from transplanting as larger plants.

Alternatively you can grow your own plants from seeds or cuttings. For more information on this there are two environment topics covering *Raising Native Plants from Cuttings* and *Raising Native Plants from Seed*.

Planting tips

To maximise growth, plants need to be well cared for before and during planting. Always be conscious of protecting the roots from the sun. Don't take plants out of containers until immediately before they are planted in the ground.

Successful planting:

- Handle plants carefully to avoid root damage. Roots must be kept moist and out of direct sunlight at all times.
- Chip off the sod that has been previously sprayed with herbicide and place it to one side.



*A well planted Sequoia sempervirens – pre-sprayed site, hole dug and bare-rooted specimen carefully planted with the soil replaced and firmed.
Photo: Susan Mackintosh.*

- Dig a good size hole and loosen the soil in the bottom of the hole. The hole needs to be twice the size of the container.
- Slow release fertiliser can be added to the soil to help growth on low fertility sites. Ensure it is not a type that will damage the roots. Alternatively place it in a slit 30cm from the tree. Most natives will do well without fertiliser.
- With potted plants, scrunch the roots to loosen the roots.
- Set the plant in the hole. Make sure the roots point downwards, are not bent or crooked. The roots may need trimming to achieve this.
- Plant the tree straight and no deeper in the ground that it was in the container, or for bare-rooted plants, up to where it was previously in the soil.
- Fill the hole with soil to three quarters full. Give the plant a very gentle lift to set the roots in a natural position and continue filling with soil ensuring there are no air pockets around the roots. Gently firm the soil around the plant so that it can withstand a firm pull without moving, getting no closer than 5cm from the stem when firming. Do not over compact with the heel of your boot.

Maintenance

New plants will grow quicker if competition from weeds is reduced in the first two to three years. Maintain the animal pest control and protect the plants from diseases and nutritional deficiencies. Other tasks are trimming, thinning and planting replacements.

Watering may be needed during dry summers for the next two to three years.

On-going weed control

There are some general principles you can follow to keep weed control manageable:

- Check on weed growth regularly, especially during spring and summer, as it is easier to control weeds in the early stages.
- The smaller the plant the more susceptible they are to being smothered by grass and weeds. Native plants are particularly susceptible to smothering.
- Hand or chemical release (weed) your plants regularly for the first few years.

Fast growing tree species may only need weed control during the first year, but slower growing species may require weed control for up to three years.

- Hand releasing and mulching are effective control methods but are time consuming. Hand releasing means physically pulling weeds out. This foliage, plus bark or straw, can be laid around the base of the tree to inhibit weed growth.
- Post plant spraying is the easiest method of releasing, with many effective herbicide sprays and granules containing residual properties available. However, you must find out which herbicide you can use around your plants. Contact your chemical supplier, experienced nursery staff, planting contractor, or farm forester.
- Release spraying can be carried out using a knapsack sprayer or a spot gun. Knapsack sprayers give better control for release spraying around plants liable to damage from herbicide.
- If release spraying, weeds and grasses should not be allowed to grow more than 10cm high. Avoid any spray contact with the stems and leaves of your plants and spray on a calm day.
- If vegetation does become rank, it may be necessary to hand grub or stamp down the weeds before spraying to avoid any contact between the sprayed weeds and the plants.
- Do not control grass and weeds with stock as they will eat the trees..

Replanting and trimming

While the aim is 100% survival, you can't expect 100% success with any planting. But if you plant good quality plants of the right species, at the right time of the year and protect them well you can expect good survival rates.



Replant in the spaces where you have lost trees to ensure continuity of shelter. Most deaths will occur in the first few months so monitor plantings and replant as soon as you can.

Side trimming shelterbelts regularly will considerably enhance the effectiveness of the shelter and prolong the useful life of the shelterbelt.

References

Trees on farms: a guide with local experience of growing trees in the Waikato Region. Environment Waikato, Hamilton, 2002. www.ew.govt.nz.

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Clean Streams: A guide to managing waterways on Hawke's Bay farms. Reviewed by Hawke's Bay Regional Council. Dexel, Hamilton, 2004.

Planting native plants in Hawke's Bay. Hawke's Bay Regional Council and Department of Conservation. Napier.

Guide To Successful Farm Forestry: A Hawke's Bay Perspective

Kevin Thomsen, Simon Stokes, Alec Olsen & Susan Mackintosh, to be published 2005.

For further information

For further information on Sustainable Land Management issues and Conservation Trees ask for other titles in this series or contact Land Management Officers at Hawke's Bay Regional Council.

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