

Options for Successful Establishment of Native Species[©]

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INTRODUCTION

The two options that come to mind are:

Option 1

You allow poor planning, management deficiencies, and poor execution to ruin your results, or

Option 2

You do everything well and on time. The seasons don't wait.

SIX ASPECTS TO SUCCESSFUL ESTABLISHMENT

In common with exotic species there are six aspects to the successful establishment of natives.

Planning and Site Preparation

Plan in advance. Site preparation involving fencing, weed spraying, and animal control may have to start 2 years in advance. Machinery may be required. Order planting stock in advance so that species you want are available and of the quality that you require and nurseries have time to grow them.

Nursery Production

1. Open Ground Production. For large scale native afforestation, open ground (bare root) production is an option. Methods for the cost-effective large scale raising of native species were developed at the Forest Research Institute in the 1950s and early 1960s and we grew many thousands in the following years to provide planting stock for native forest rehabilitation.

In order to produce 1-year-old planting stock the preferred option is to sow in plug trays in the winter and to transfer resultant plug seedlings into preformed and pre-dibbled beds in the spring. From then on the trees are "grown off the tractor seat". The copper treatment (see below) as an option in container grown plants is equally an option for plug grown seedlings transferred into open beds.

2. Container Growing. The horticultural approach of predominantly single plant culture is the prevailing method of raising native plant stock in New Zealand. Some nurseries have installed cavity tray filling and precision sowing lines in recent years. These do away with pricking out, a labour intensive procedure, often resulting in tap root distortion. Cavity trays produce plug grown plants which are then transferred into larger containers.

To improve the quality of container grown root systems, treatment with cupric hydroxide (CuH_2O_2) on the inside of containers is an option. This treatment, apart from stopping the development of curling and tangled roots, also has a fungicidal effect, which is useful for species subject to root rot problems. In addition the treatment allows easy de-plugging without root damage.

The following is a copper paint recipe for spraying container walls. Mix together 1 L white water-based ceiling paint with 1 L water, then add 240 g Kocide[®] 2000DF, containing $350 \text{ g} \cdot \text{kg}^{-1}$ cupric hydroxide as a water dispersible granule.

De-bagging. The quality of root systems in planter bags is not readily assessed. Root deformities are hidden and not easily rectified at time of planting. For that reason I have chosen the option of de-bagging, root disentangling, root trimming, water dipping, and placing of trees in white forestry plastic bags.

Transport. Robust container grown trees are bulky and heavy. Shifting such plants is costly in terms of both labour and transport from the nursery to the planting site itself. The advantage of de-bagging is that root system quality can be checked and remedied prior to planting and that trees in white plastic bags are less bulky and lighter to handle. Another aspect of de-bagging is that it provides the option of establishing a mixed species plantation.

3. Storage on the Planting Site. If plants have been de-bagged and are thus bare-rooted it is increasingly important to keep them cool and wet and protected from sun, wind, and frost. Laying bare-root plants out ahead is not an option.

4. Planting. Plant bare-rooted or de-bagged trees from autumn to spring in the cooler and wetter parts of the year. Cultivate the planting spot, plant deeply and firm plants in well. Do not stuff the roots in the hole. Water in if necessary — the use of the local fire brigade is an option! They enjoy the practise!

5. After Care. Weed control is essential, especially in years 1 and 2. Monitor weeds in year 3. Animal control is important. Broadleaf species are particularly vulnerable and the use of animal repellents is a good option.

This last winter we planted 2,000 trees and shrubs. I do not plan for failures and even this year in the drought they are growing vigorously. Anything less than 98% success is not an option. If we had 40 dead trees (2% of 2,000) we would want to know what went wrong.