

7. Plant supply and propagation

GENETIC SOURCE AND PROVENANCE

Plants must be genetically sourced. It is essential that you source plants from similar communities as close as possible to the restoration site. Introducing a native plant to an area where it does not grow naturally may reduce natural diversity by cross-pollination with local species (genetic pollution). It can also confuse knowledge of natural species distribution and ecology (Nicholls 1990). Some texts do not address the issue of provenance and recommend using native plants from anywhere, providing they will survive and look attractive. This advice should **not** be followed in restoration projects. Similarly, you should not use artificially produced hybrids and variegated native plants as they do not reflect natural distributions and provenances.

Genetic pollution will also occur if you introduce native plant stock from distant populations of the species. Such stock can reduce the expression of local and regional character. Native plants are best adapted to growing in their local conditions, as the same species from different areas can differ in frost hardiness, drought tolerance, salt tolerance and pest resistance. Genetic pollution may also disrupt co-evolution between native plants and animals.

Severely depleted communities have lost much of their original diversity. If a local plant source is not available, you should at least obtain plants from the same ecological district. In highly modified areas or those with uncommon species, you may have to source plants from the fringes of the ecological district, from the wider ecological region, or even further afield. In this situation, always seek botanical advice first. As an example, *Euphorbia glauca*/waiūatua has been reintroduced to Canterbury from N. Otago, the nearest natural population.

- Deal only with nurseries that can guarantee genetic sourcing.
- Apply the principles of genetic sourcing if you are raising plants privately.

Caution

Always check the source of your plants. Some nurseries sell plants as local native species when they are not. For example, North Island lacebark/hoheria and kōwhai and exotic male fern are often sold at Christchurch fairs and garage sales as local natives.

PROPAGATION AND PLANT STOCK

Order your plants well in advance of when they are needed. From the time of seed collection, it may take 1-2 years until the plants are ready for planting, depending on the species involved.

If you are propagating plants yourself, growing from locally harvested seed is preferable to taking cuttings as seed produces greater genetic diversity. For detailed propagation information, refer to Metcalf 1995, Porteous 1993 and the Native Plants Course at the Open Polytechnic (phone 0800-507-333).

Genetically sourced nursery-grown stock is a better option than digging up wilding plants. Table 5 summarises the plant grades available at nurseries and their characteristics. Nursery-grown plants are likely to be of better quality and a more suitable size for planting than wildings, which have a lower survival rate. Ill-considered collecting may confuse genetic sourcing and deplete the source area. Wilding plants are also more likely than nursery-grown stock to introduce insect pests and diseases, which could infest existing remnants.

If you must use wilding seedlings and plants, do **not** take them from protected areas. The best sources are from second-growth forest or under pine trees that are to be logged.

Fungi associated with plant roots

Specialised fungi (mycorrhiza) are associated with the root systems of many plants. They assist with the uptake of water and nutrients, and may confer drought-tolerance to the host plant. The poor transplant ability of kānuka, mānuka and beeches may reflect a lack of suitable fungi. This problem may be reduced if you add ground up material from soil or the forest litter of natural stands to their containers.

When you are ordering plants from a nursery:

- For droughty, exposed or low-fertility sites, use root trainer stock (ideally 30 cm tall) so long as weed control will be effective. Larger or bare-rooted stock, such as NZ flax/harakeke, may need to be cut back.
- If weeds or pests are a concern on better sites, use container-grown plants 50-100 cm tall. Podocarps should always be planted at this size.
- Clip leggy nursery stock (e.g., kānuka and mānuka), but retain around 30 cm of foliage. This induces a more stocky form and reduces transpiration until the root system has developed.
- For sand dunes, select plants 30-70 cm tall, depending on the species (Bergin 1999, Bergin 2000, Bergin and Herbert 1998) and rainfall.

Table 5. Nursery plant grades and their characteristics

Plant grade	Description	Advantages	Disadvantages	Average Cost
O/G (Open Ground)	Grown in prepared beds. Bare-rooted plants lifted before delivery. Available generally for NZ flaxes, grasses, hebes, podocarps and pittosporums	Larger and well-established plants. Low cost.	Need extra care. Care needed with transport and storage. Soil may compact around roots. Optimal soil moisture and weed control needed.	\$0.90 - \$2.00
RT (Root Trainers): RTH (Hilson)-172 ml RTT (Tinus)- 352 ml	Plastic containers in sets of four hinged along the bottom. Vertical grooves to discourage spiral roots. Containers can be reused	Fast growth from seed tray to planting. Good root structure, little trimming. Low cost per plant. Roots can be inspected without disturbance. Easy to transport.	Need extra care. Root damage possible when plant taken out of container. Small to medium plants need good weed control to overcome competition. Plants can be "leggy" with little lower foliage. Plants can't be placed individually on site.	\$0.95 - \$2.50
PB (Planter Bags): PB 2 PB 3 PB 5	Black plastic bags. Higher number = more soil, more roots and a bigger plant. Produces cylindrical root ball.	Bushier plants. Good height and root system. Easy to plant. May survive better in difficult sites.	Roots tend to spiral and become tangled. Overgrown roots need trimming. Bulkier to transport to the planting site. Higher cost per plant.	\$3.00 - \$7.50 depending on size and species
Pots RX 90 (90mm) O/P - Olive Pots (90 mm) 1 lt. (100mm)	Rigid plastic pots. Good shaped root plug. Medium size plant with balanced foliage growth. Pots can be reused.	Fast growth from seed tray to planting. Medium size plants. Good balance between roots and vegetative growth. Easy to plant especially in difficult sites. Low to medium cost per plant. Roots can be inspected without disturbance. Can place plants individually on site.	Overgrown matted roots need trimming. Medium size plants need good weed control to overcome competition.	\$1.50 - \$2.50

Note: The availability of open-ground or container stock varies according to species growth rates and the preference of the grower for producing different grades. Always choose stock that looks healthy, has foliage that is not soft and lush, and is not root bound.

