



CHAPTER 3 - SITE SELECTION

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In its natural habitat, redwood grows from sea level to 900 metres altitude but prefers altitudes lower than 750 m. It prefers mild climates, although in many parts of its natural range it experiences winter snow and frosts of up to -10°C . The presence of well performing stands near Winton, Southland; North Canterbury; and Hamurana Springs. Whakarewarewa and Waiotapu near Rotorua, attest to the species' ability to do well in some cold sites in New Zealand. However, it is vulnerable to out-of-season frosts, perhaps the reason for the much publicised early establishment failure of various stands in the Central North Island during the 1920s and 1930s.

Assessment of the performance of redwood on a wide range of New Zealand sites over the last ten years has shown that the species has a wider range of site tolerances than previously thought. However, redwood performs best on soils of moderate to high fertility in areas with reasonable year-round rainfall. Avoid planting redwood on terraced sites where deep sediment deposits can lead to anaerobic conditions unfavourable to redwood growth. Redwood is intolerant of strong prevailing winds, but is surprisingly resistant to toppling and breakage from periodic storms. (Note that despite its common name coast redwood, derived from its natural range being close to the coast, redwood is *not* tolerant of salt-laden coastal winds!).

Sequoia Action Group Research Packs

During the winter of 2002, the Sequoia Action Group, of the New Zealand Farm Forestry Association, arranged for individuals to plant small plots with up to eight representatives of eight clones of redwood on a range of sites throughout New Zealand. The trial was designed by Prof. Bill Libby. Spacing was 5 m x 5 m, and plants were in groups of four identical clones.

The trials were assessed by farm foresters in 2006. In all 34 replies from the 53 sites were returned (64%), seven sites were abandoned, three failed because of frost, two because of soil erosion and or slips, and one had problems with chemical control.



This left 27 sets of data for analysis. Preliminary results are presented below. This shows a huge variation in growth with over 4 m difference between the best and poorest-performing sites. Considerable variation also occurred between plantings within regions. In Northland alone there was nearly 4 m difference between the best and worst site. The mean of the 19 North Island sites was 2.53 m, while the mean of the eight South Island sites was 1.5 m.

While the trial layout was the same and the clones were repeated on each site, it is difficult to interpret the main reasons for the difference in growth performances, as individual owners managed site preparation and weed control in different ways. Differences are likely to be at least in part due to microsite differences in both soil and site. More time and soil sampling is needed to determine this.

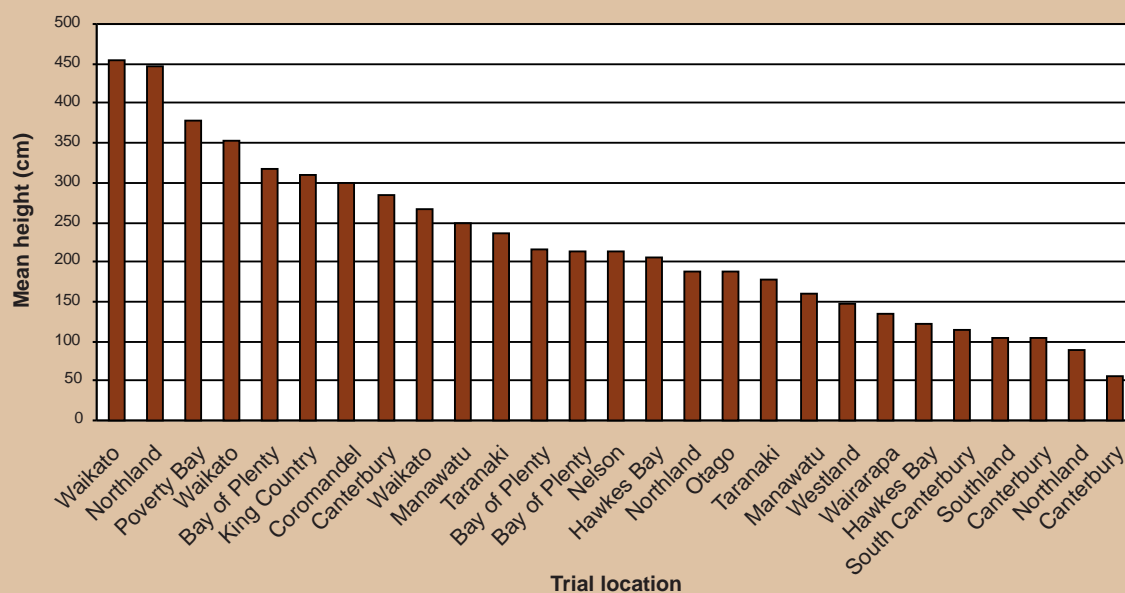


Figure 8: Average trial height at age 4 years

Giant sequoia has not had the plantation history of redwood to help guide siting recommendations. However the successful plantings in parks around the country, in particular, in cold and dry inland South Island locations, supports the impression that giant sequoia can tolerate colder and drier conditions than redwood, although a study of trees surviving droughts in the early 1990s identified giant sequoia as susceptible to drought.



Key Points

- Redwood is very site sensitive
- Avoid severe out of season frost sites
- Avoid exposed locations
- Avoid coastal situations
- Redwood does best in moist valley bottom locations
- Giant sequoia can tolerate cold dry sites as a specimen tree, but its site requirements as a plantation crop remain unclear.

Suggested reading:

Knowles and Miller 1993

Snowdon 2003

Webster 2008

Marden 1993

