

PRELIMINARY RESULTS OF PROVENANCE TRIALS OF  
BEEFWOOD (Casuarina cunninghamiana) IN CALIFORNIA

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Beefwood (Casuarina cunninghamiana Miq.) is a fast-growing evergreen tree native to Australia that is cultivated in California for shelter, fuelwood and erosion control. Like other casuarina species, it can form a symbiosis with the nitrogen-fixing Frankia bacteria which enhances the tree's performance on infertile sites. Studies have shown a high degree of variability within the species, both in the native range and overseas planting trials.

Field trials of selected provenances of beefwood were established in 1987 at five sites in northern California. A total of 130 open-pollinated families representing 13 provenances collected from native stands in New South Wales, Australia were planted at three sites of equal experimental design. The objective of these trials is to determine the amount of inherent genetic variation within and between beefwood provenances, and at the conclusion of the trial in 1992 to identify superior individuals and families for inclusion in a clonal seed orchard. In addition, four supplemental trials using bulked provenances were planted to test responses to several environmental and cultural factors: frost, wastewater effluent irrigation, Frankia inoculation and selective pre-emergence herbicides.

Early results of the main provenance trials indicate a high degree of variation between and within provenances. Based on height growth at 6 and 12 months after planting, only one provenance (Singleton, NSW) was significantly taller over all three sites. At one year old, the Singleton provenance was 7% taller than the mean height for all provenances over all sites, and about 13% taller than the lowest-ranked provenance. Families within provenances also varied significantly. The tallest families at each of the three sites were from 10 to 20% greater than the mean heights, and from 26 to 44% taller than the slowest-growing families. In a supplemental trial of Frankia inoculation, height growth at six months after planting was significantly greater with inoculation in four out of five provenances compared to those not inoculated prior to outplanting.