KARRI PROVENANCE TRIALS

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NATURAL OCCURRENCE

Karri, Eucalyptus diversicolor, occurs between latitude 34° - 35° South, longitude 115° - 118° East. Within these boundaries there are approximately 150,000 ha of karri. The main karri belt is associated with the river systems of the Donnelly, Lower Warren, Gardner, Deep, Shannon and Lower Frankland. Outliers are found at Karridale, Margaret River, Yallingup, Black Point, Mt. Barker, Porongorups, Mt. Many Peaks and Rocky Gully. In the central area of the karri occurrence the tree typically grows on a red-brown-yellow-brown loamy sand derived from granite gneiss exposed by stream flow. Near the south coast karri grows on soils formed on large residual granite-gneiss outcrops on previously drowned coastline. The Karridale and Mt. Many Peaks outliers grow on red sandy soils derived from limestones. Rainfall in the main karri areas is 1125 mm per annum or higher, but possibly falls as low as 875 mm in some of the outliers, although these outliers could occur in localized pockets of higher rainfall. Karri growing near the coast in some areas must at times be subject to considerable quantities of salt laden wind. The non-continuous nature of karri occurrences and the comparatively isolated nature of some of the outliers suggests the possibility of some variability in trees raised from seed from different areas.

PROPOSALS TO TEST VARIABILITY

In 1970, it was decided to test variability within the species by trial planting of seedlings raised from seed of trees from different karri areas. Plantations or orchards were to be established at three different sites, situated in the Donnelly Valley and in the Pemberton and Northcliffe areas. These planting sites, although not covering the full natural range of the species did cover the main physiographic types of the commercial range of karri forest and were also in reasonable proximity to Manjimup Research Station. Fifty seedlings from each seed source were to be planted in the Pemberton orchard and replications of fifty each, when available, planted in the Donnelly Valley and/or the Northcliffe orchards.

Trees to provide seed were to be selected as the best available in all known stands of karri including outliers. The number of trees to be sampled was based on the number of stands within a drainage system with 75% of the total number of trees being allocated to the main karri range and 25% to the outliers.

SEED COLLECTION AND PLANTING

During the years 1971, 1972, 1973, while karri seed was available in the crowns, it was collected from approximately 120 trees. Collections were obtained either by shooting down a branch from standing trees, or collecting directly from crowns of trees cut during trade operations. Each tree was described and given a Serial number which was applied to that particular seed lot. Plants were raised in Jiffy Pots in a sterilized sand-peat mixture. Planting was carried out in units of ten plants, replicated five times on randomly selected sites within each years planting, i.e. 1972 and 1973 seasons.

RESULTS

In late 1976 a portion of the 1972 planting in the Pemberton and Northcliffe orchard was measured and although there were considerable differences in average height of serial numbers collected from different stands there were also large differences in height of individuals collected from the same stands. Although results of height measurement at this age are inconclusive a trend which does emerge is that karri from the main range is making better growth than that from the outliers with the notable exception of that from the Porongorups.

Table showing average height of stems by seed sources at age 4 years

Block	Mean Ht. (cms)
Yallingup	533.5
Mt. Many Peaks	565.5
Black Point	631.0
Mindanup	651.0
Boranup	655.5
Boorara	672.5
Mattaband	688.5
Poole	696.0
Jane	698.5
Marinup	715.5
Porongorups	734.5
Warren	757.0

It is possible that karri from the coastal outliers, i.e. Yallingup, Karridale, Mt. Many Peaks and Black Point, have adapted to growing on a different soil type and may not be so suitable for growing on typical karri soils. The only significant differences in height growth are between Yallingup and Warren Block seed sources. Increasing age of the planted stems may show greater differences in height and also in form of these different seed sources.

FUTURE PROPOSALS

It is intended to utilize the information obtained from these trials to plant several areas for future seed production, utilizing parent seed from trees or areas which show superior growth and/or form habits.