



# Drooping she-oak provenance *research in south west Victoria*

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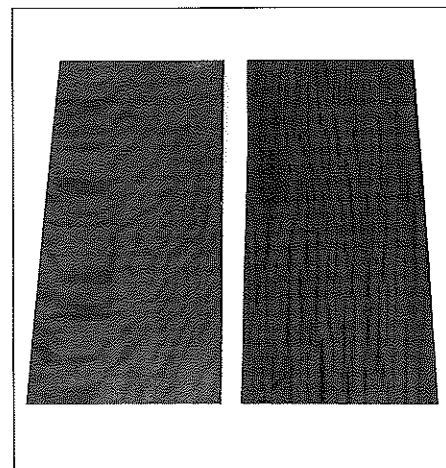
**In 1994, trials of drooping she-oak were established in south west Victoria to investigate growth and form, and the species suitability in farm forestry. Although it seems that much selection will be required to produce trees of superior form for this purpose, a 2-4 m clearwood sawlog could be an acceptable target for such a potentially valuable timber (Bird, 2000).**

Drooping she-oak naturally occurs as a small tree in south east Australia on a diverse range of generally poor soils, from exposed sandy coastal limestone headlands and inland gorges to undulating basaltic clay-loam plains and sedimentary inland plains (Bird, 2000). It occurs over quite a wide rainfall distribution but growth is usually restricted when the annual rainfall drops below 450 mm. Plantings of drooping she-oak for clearwood production would be suited to small areas of well drained land (including rocky areas) that are unsuited to other uses.

The sawn timber has a dark, fine-grained red brown finish. It is heavy and has striking medullary rays that are likely to enhance its value in appearance-grade products. These rays can be enhanced through quarter-sawing, although back-sawing also produces a very decorative, wavy appearance, contrasting the dark brown rays and the lighter brown matrix (Figure 3).

Drooping she-oak can be sawn and air-dried without significant distortion or splitting provided that it is done slowly under cover with reduced air circulation. For maximum stability the boards should then be kiln-dried to 12% moisture content.

**Figure 3. The striking medullary rays of the quarter-sawn (left) and back-sawn (right) she-oak timber.**



## Experimental Design

Three research sites (Table 1), comparing 10 drooping she-oak provenances (Table 2) were established in September 1994. The trial was designed as a randomised complete block, with four blocks (two of which were fertilised) and two rip patterns. Each treatment plot traversed the block as a line-plot of 17 trees, at 1.5 m spacing, with another 3 trees on each end as buffers. Initial spacing of the trees was high (2220 stems/ha) to encourage straight stem growth and light branching.

## Management

Planting lines were ripped on a 3 m grid pattern, to a depth of 40-50 cm. Trees were planted alternately on cross-ripped and single-rip lines. Alternate trees in each line, those on cross rips, were guarded. Weed control was provided prior to planting with applications of glyphosate (3 L/ha) and glean (30 g/ha). Herbicides were used late in the next 2 years where weeds persisted.

Survival, height and diameter at breast height (DBH) measurements were recorded for all trees at approximately 5 years of age. Trees were form-scored in April 2000, to ascertain stem straightness (scores 1-4), branch thickness (scores 1-4) and presence of forking (scores 1-6), using CSIRO protocols. However, form-scoring has been performed on trees after they have received some form-pruning and unmanaged trees would not rate as highly in regard to forking and branching.

## Results

Survival was high at each of the three sites (Table 1). Differences in early growth of the provenances were not great (Figures 1 & 2). The Hamilton provenance (22) consistently performed well across the three sites. Of the other local provenances, Dundas Gap had good diameter growth but generally poor form. Statistically, the Wannon (23), Wickliffe (19) and Bushy Creek (25) provenances were not superior to Mt Stromlo, ACT (17). Other strong performers included the Winchelsea (21) and Cape Clear (15) provenances. The best form was shown in the Hamilton provenance, particularly in regards to stem straightness (Table 3).

The application of fertiliser (150 g/tree, Pivot 800) did not significantly increase growth. The effect of guarding (combined with cross-ripping) was significant at

**Table 1. 1994 river she-oak provenance trial site details**

Site	Land zone	Rainfall (mm)	Survival (%)
Balmoral	Laterised tablelands	650	96
Branxholme	Basaltic plains	725	89
Vasey	Laterised tablelands	650	96

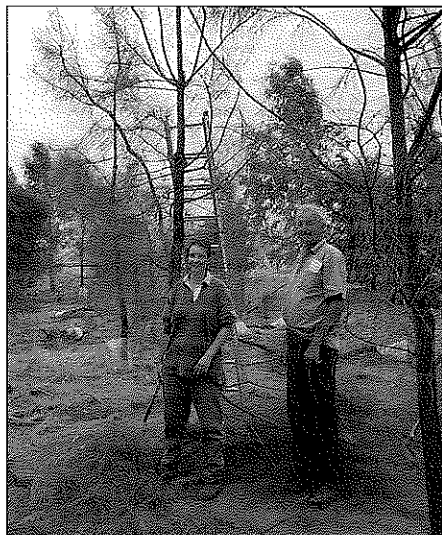
**Table 2. Drooping she-oak seedlots used in the 1994 trial**

Number	Location	State	Source	Altitude (m)
15	1 km from Cape Clear	VIC	ATSC - 17416	260
16	Anglesea Rd	VIC	ATSC - 17319	60
17	Mt Stromlo	ACT	ATSC - 15289	740
18	Donnybrook	VIC	ATSC - 17309	200
19	Wickliffe cemetery	VIC	ATSC - 17415	220
20	Dundas Gap Rd (East)	VIC	PVI 1994	250
21	10 km east of Winchelsea	VIC	PVI 1994	180
22	Old Reservoir, Hamilton	VIC	PVI 1994	220
23	Wannon 18 Acre Reserve	VIC	PVI 1994	150
25	Bushy Creek, S of Glenlthompson	VIC	E. Fenton 26639	250

Branxholme and Vasey. Mean height comparing guarded and unguarded trees was 4.9 m v. 4.6 m at Branxholme and 5.5 m v. 3.3 m at Vasey. Rabbits (and wallabies at Vasey) browsed the unguarded trees resulting in slower growth.

### Conclusion

No significant interactions were shown between site and provenance. The local drooping she-oak provenance from Hamilton displays the most promise, having favourable growth and form. Fertiliser had no effect on growth and form of the trees. At the sites where browsing was a problem, growth of the guarded trees significantly exceeded that of the unguarded trees. Drooping she-oak has the potential to provide the grower with some beautiful timber. Careful selection could lead to an increase in the sawlog length attainable at harvest.



Mick & Suzanne Pern, Balmoral.

### References

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Table 3. Percentage of trees having desirable characteristics

Provenance	Balmoral			Branxholme			Vasey		
	S	F	B	S	F	B	S	F	B
15	56	65	52	57	59	47	61	41	43
16	59	66	63	75	45	40	70	35	74
17	46	64	57	37	37	35	36	20	71
18	27	71	48	47	54	61	53	30	71
19	34	65	52	30	15	46	32	25	75
20	47	61	61	38	24	41	59	42	58
21	56	67	76	44	41	27	48	28	65
22	84	67	76	69	43	24	80	27	87
23	70	83	69	47	47	47	72	31	81
25	30	42	63	31	39	34	40	38	60

S = Stems with 1-2 small bends or no bends (scores 3 & 4)  
 F = Stems with forking in top quarter or no forking (scores 5 & 6)  
 B = Light branching, with 1 branch > 1/3 diameter of main stem, or all branches < 1/3 diameter of main stem (scores 3 & 4)

Figure 1. Height of drooping she-oak provenances

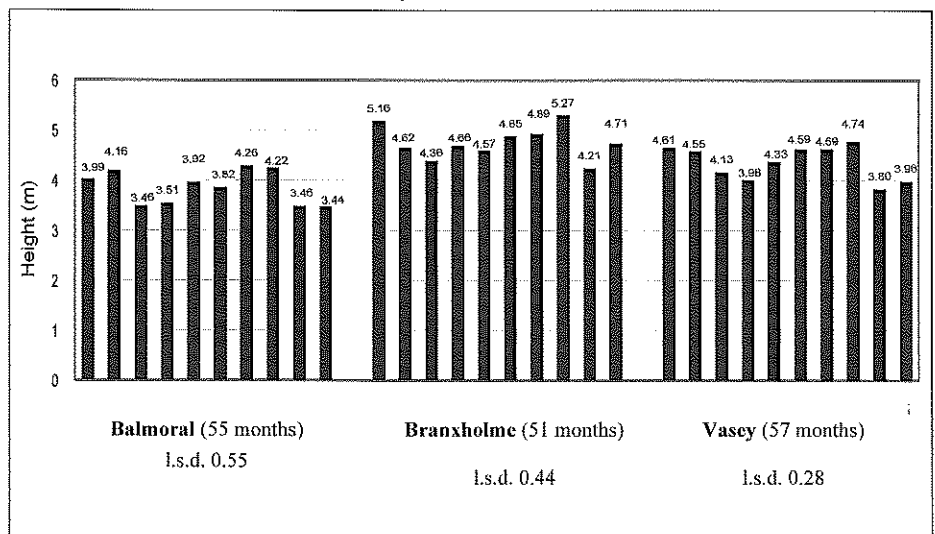


Figure 2. DBH of drooping she-oak provenances

