Black and silver wattle: *provenance research in SW Victoria*

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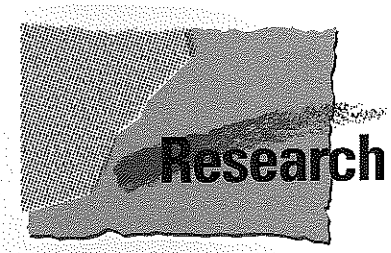


INTRODUCTION

Black and silver wattle are fast-growing on a range of sites, some of which are unsuitable for other species, such as blue gum. These sites include infertile sands with rainfall as low as 500 mm, and heavy clays subject to winter waterlogging. Wattles are also potentially useful as a fast-growing nurse crop for other species, providing shelter, nitrogen and an early return of firewood (Bird 2000).

A wide range of products are possible, including firewood, charcoal, chipwood for fine paper production, and bark for tanning of leather (Searle 2000). The wood can also be used for appearance grade furniture and panels. Farmers will be able to value-add by using portable mills and air-drying the sawn timber. Kiln-drying may be required to improve the stability of some finished products (Bird 2000).

This research in the Hamilton area investigates the growth and form of particular provenances on different sites. Similar work is being done in WA and NZ (Shelbourne et al 1997). Market research and promotion is required to create a specialty timber industry and sales of other products including fuelwood, composites and charcoal.

Methods

In 1997 and 1998, in collaboration with the forestry company GPFL, we established a selection of A. mearnsii (11 seedlots, including 2 from S. Africa) and A. dealbata (4 seedlots) at 8 research sites. The provenances are listed in Table 1 and details of the sites are in Table 2. E. globulus was included at 3 sites for comparison. The experimental design was 4 randomised complete blocks at each site, with 12 trees per provenance plot. Trees were spaced 2 m apart on ripped and mounded rows that were 4 m apart (1250 stems/ha). Two rows of buffer trees surrounded the sites. Survival was excellent at all sites (>95%).

Trees at each site were assessed for height, diameter at 20 cm above ground and form at 21-25 months after planting (Table 2). Form was scored on a scale of 1-7, where trees that might achieve a first grade sawlog were given a score of one, or two if form pruning was required (Bird 2000). Two sites, North Byaduk 2 and Strathkellar, were to be managed for clearwood production. Trees at these sites were form-pruned one month after assessment, and the number of branches removed was recorded.

Results

Trees at Broadwater have performed very well, and the Strathkellar plains-basalt was the poorest site (Table 3, Figure 1). Generally, black wattle had better growth but poorer form than silver wattle. An exception was at Wando Heights, where silver wattle was as good as black wattle, and Errinundra (1) performed best of all provenances. Where blue gum (16) was included, it grew significantly faster than all acacias.

The South African seedlots (5 & 6) showed good growth, with Natal seedlot (6) consistently among the best in terms of stem volume. However, these seedlots had relatively poor form (Table 3), due to poor stem straightness and heavy branching (data not presented).

Provenances with the best form included Errinundra (1) amongst the silver wattle and Bungendore (12) and Kyneton (13) among the black wattle (Table 3). The growth of these black wattle provenances was also relatively good. In regard to form, provenances ranked similarly across all sites (data not presented). Form-pruning data from North Byaduk 2 and Strathkellar also gave similar rankings, with the mean number of branches removed per tree ranging from

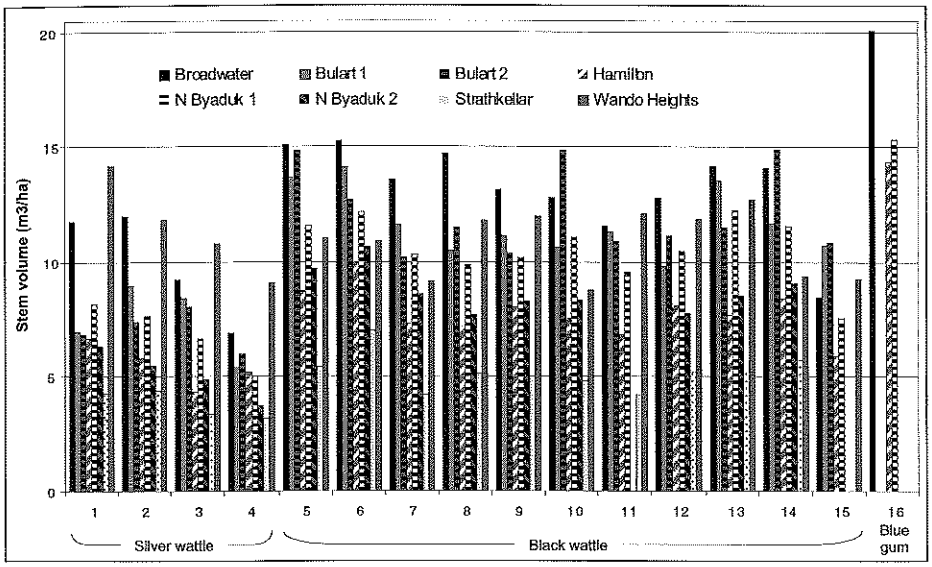
Table 1: Provenances of black and silver wattle in trials in south-west Victoria

No	Species	Provenance	State	Nursery/ Seedlot	Latitude (°-min)	Longitude (°-min)	Altitude (m)
1	A. dealbata	Errinundra Plateau	Vic	ATSC 16271	37-11	148-52	960
2	A. dealbata	18.6 km S of Orford	Tas	ATSC 16384	42-41	147-52	120
3	A. dealbata	Kandos, near Lithgow	NSW	ATSC 18973	32-56	149-54	600
4	A. dealbata	S of Cooma, NSW	NSW	ATSC 19778	36-29	149-06	900
5	A. mearnsii	Harding Natal	S Africa	ATSC 15087	30-35	100-59	932
6	A. mearnsii	Natal	S Africa	ATSC 15088	29-32	30-28	838
7	A. mearnsii	SE of St. Leonard	Tas	ATSC 15858			
8	A. mearnsii	S of Nowra	NSW	ATSC 16246	34-59	150-36	10
9	A. mearnsii	Tuross R, SW Bodalla	NSW	ATSC 16621	36-11	149-58	15
10	A. mearnsii	Tantanoola	SA	ATSC 17927	37-41	140-28	30
11	A. mearnsii	Wattle Circle, Omeo Hway	Vic	ATSC 17933	37-27	147-50	200
12	A. mearnsii	N Bungendore	NSW	ATSC 18975	35-11	149-32	760
13	A. mearnsii	Blackhill Res, Kyneton	Vic	ATSC 18979	37-12	144-29	520
14	A. mearnsii	N Byaduk, S Hamilton	Vic	PVI 1987	37-50	141-57	170
15	A. mearnsii	Apsley River Bridge	Tas	ATSC 19815	41-56	148-14	10
16	E. globulus	Dow Chemical site	Vic	1997 stock			

Table 2: Black and silver wattle provenance research sites in south-west Victoria

Site	Rainfall (mm)	Landzone	Description	Date planted	Age (m) at measurement
Broadwater	750	Basalt plains	Heavy basalt soil	18/9/97	21
Bulart 1	650	Laterised tablelands	Well drained hill-crest	1/9/98	25
Bulart 2	650	Laterised tablelands	Slope near saline creek	3/9/98	25
Hamilton	700	Basalt plains	Well-drained slope	10/9/97	22
North Byaduk 1	700	Basalt plains	Sand over basalt	16/7/97	24
North Byaduk 2	700	Basalt plains	Sand over basalt	17/7/97	24
Strathkellar	680	Basalt plains	Plains basalt	13/9/97	22
Wando Heights	750	Laterised tablelands	Elevated site	31/8/98	2516

Figure 1: Stem volume (m3/ha) of provenances of black and silver wattle at 21-25 months



0.38 (N Bungendore black wattle at Strathkellar) to 2.29 (N Byaduk black wattle at N Byaduk).

No major problems with insects have been encountered. The Wando Heights site suffered some early grazing by kangaroos and damage to tops by birds, which was reflected to some degree in the form scores (data not presented).

References

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Using Ironbark tops for firewood and fence droppers

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and limited means of containing the multi-dropper bundles, it was more effective to drill single droppers.

Allowing for my time in preparing billets, transporting and drilling the return per cubic meter of timber was approximately $1200.

This was a gain of $1150/m3 over the return from firewood.

For future timber we do not plan to plant trees because of the rapid rate of re-growth occurring on the property. Some thinning and pruning is to be trialled to determine optimal management strategies for the re-growth.

Some of the salient points we learnt from this include:

- Electric fence droppers have potential to value add the use of short lengths of wood in suitable species.
- A use, other than firewood, is yet another gain for the environment.
- Large machinery is not required.
- 6' x 4' box trailer with extended draw bar (posthole digger boom) was used to transport 400mm x 40mm x 6m hardwood beams.
- Large, heavy pieces of timber may be moved by sliding – this saves the back too!
- Portable mills can significantly value-add.
- Take advantage of circumstances (like passing excavators).

Table 3: Mean height (Ht), diameter at 20 cm above ground (D) and overall mean percentage of trees with form score 1 or 2 (Fscore 1 or 2) for provenances of black and silver wattle at 21-25 months

No	Fscore	Broadwater		Bulart 1		Bulart 2		Hamilton		N Byaduk 1		N Byaduk 2		Strathkellar		Wando Heights	
	1 or 2	Ht	D	Ht	D	Ht	D	Ht	D	Ht	D	Ht	D	Ht	D	Ht	D
	(%)	(m)	(mm)	(m)	(mm)	(m)	(mm)	(m)	(mm)	(m)	(mm)	(m)	(mm)	(m)	(mm)	(m)	(mm)
1	59	5.14	78	4.14	66	3.46	67	4.03	64	4.25	72	4.09	63	3.78	53	4.79	90
2	41	5.04	78	4.09	74	3.81	70	3.65	61	3.88	69	3.84	59	3.55	53	4.37	84
3	35	5.00	69	4.35	72	4.39	70	3.66	55	4.10	65	3.91	56	3.61	47	4.58	80
4	40	4.59	63	3.86	61	4.03	63	3.96	58	3.82	56	3.71	50	3.56	47	4.16	76
5	13	5.42	88	5.21	84	5.29	88	4.23	73	4.71	80	4.73	75	3.98	58	4.59	81
6	14	5.54	87	5.48	85	5.13	81	4.51	76	4.94	82	4.96	78	4.16	66	4.61	80
7	17	5.13	84	4.68	82	4.38	78	3.92	70	4.37	80	4.35	73	3.53	54	4.11	77
8	10	5.57	86	4.87	77	4.63	80	4.03	69	4.46	75	4.51	68	3.78	57	4.73	82
9	17	5.65	80	5.04	78	4.81	76	4.55	69	4.76	75	4.84	68	3.98	56	4.76	83
10	22	4.93	83	4.45	79	5.03	90	3.85	70	4.40	83	4.22	72	3.53	58	4.11	76
11	20	5.10	77	5.03	78	4.87	77	4.11	66	4.58	73	-	-	3.78	51	4.77	84
12	33	5.63	79	4.76	73	5.00	78	4.52	70	4.82	77	4.51	68	4.04	57	4.74	83
13	32	5.46	86	5.16	84	4.79	78	4.09	69	4.74	83	4.57	71	4.03	59	4.79	85
14	14	4.97	87	4.80	80	5.28	88	4.13	72	4.44	82	4.52	74	3.90	61	4.16	77
15	18	4.71	69	4.70	78	4.90	77	3.71	60	3.94	66	-	-	-	-	4.27	75
16	75	6.10	94	-	-	-	-	4.87	90	5.06	90	-	-	-	-	-	-
lsd		0.442	6.6	0.391	8.1	0.595	9.1	0.391	6.0	0.394	7.0	0.327	6.7	0.363	5.5	0.304	4.3