Report on Burnerbinmah and Thundelarra Sandalwood trials, March - April 1996.

Jon Brand
Science and Information Division
Conservation and Land Management
COMO WA 6152

Sandalwood seed enrichment

Unfenced plots

Four different land types were selected for sandalwood seed enrichment trials on Burnerbinmah and Thundelarra stations. Land Type maps developed by Agriculture, W.A. were used to identify the different land types. The four land types used were Sherwood (LT 4), Kalli (LT 12), Woodline (LT 13), and Ero and Roderick (LT 17). Sherwood is described as having breakaways, kaolinized footslopes and extensive gently sloping plains on granite with mulga and halophytic shrublands. Kalli consists of level to gently undulating plains of red sand over laterite with grassy acacia shrublands. Woodline has nearly level sandy surfaced plains over hardpan with mulga shrubland. Ero and Roderick contains alluvial plains with saline soils and predominantly halophytic shrublands.

On Burnerbinmah, sandalwood seed enrichment planting was conducted at four separate sites for each of the four land types (Table 1). At each site, sandalwood seeds were sown beneath 10 unfenced mulga trees and 10 unfenced trees of another species. The other four species were Curara (*Acacia tetragonophylla*), Jam (*Acacia acuminata*), Miniritchie (*Acacia grasbyi*), and Currant bush (*Scaevola spinescens*). A different species was enriched on each of the Land Types which were as follows: Curara (LT 4), Currant bush (LT 12), Miniritchie (LT 13) and Jam (LT 17).

Beneath each tree, four sandalwood seeds were sown on the south side and four seeds were sown on the north side. A total of 160 seeds were sown at each site and 2560 seeds were sown on Burnerbinmah.

Sandalwood seeds were sown at one site for each of the four Land Types on Thundelarra (Table 1). Similar sowing procedures used on Burnerbinmah were also used on Thundelarra where a total of 640 seeds were sown beneath unfenced host trees.

Table 1. Unfenced sandalwood seed enrichment plots on Burnerbinmah and Thundelarra.

Land Type	Host species	Seeds sown	Reps	Total seeds
Burnerbinmah				
4. Sherwood	Mulga, Curara	160	4	640
12. Kalli	Mulga, Currant bush	160	4	640
13. Woodline	Mulga, Miniritchie	160	4	640
17. Ero	Mulga, Jam	160	4	640
Total				2560
Thundelarra				
4. Sherwood	Mulga, Curara	160	1	160
12. Kalli	Mulga, Currant bush	160	1	160
13. Woodline	Mulga, Miniritchie	160	1	160
17. Roderick	Mulga, Jam	160	1	160
Total				640

All host trees seed enriched were tagged and their heights and crowns measured. Tree heights were measured to 1 cm using a measuring pole, and crowns were measured to 1 cm in north-south and east-west directions using a compass and an 8 m tape.

Fenced plots

To quantify the effect of grazing on Burnerbinmah and Thundelarra, three fenced plots were established to exclude rabbits, sheep, goats and kangaroos. On Burnerbinmah a single large fenced plot of 410 m^2 was constructed on the Kalli (L12) land type. Within this large plot, sandalwood seeds were sown beneath 9 Mulga's (*Acacia aneura*), 10 Currant bushes (*Scaevola spinescens*) and 10 Wilcox bushes (*Eremophila forrestii*). Beneath each plant, 4 seeds were sown on the north and 4 seeds were sown on the south side. An additional 20 spots within the plot were also seed enriched on bare areas of ground. At each of these spots there were no perennial species within 2 m and 4 seeds were sown per spot.

On Thundelarra, two small fenced plots of 100 m^2 and 200 m^2 were constructed on the Kalli land type. In the 100 m^2 plot, 8 seeds were sown beneath each of 10 Currant bushes and 4 Wilcox bushes. Seven spots of bare ground were also enriched with 4 sandalwood seeds per spot. In the 200 m^2 plot, 10 Mulga's and 6 Wilcox bushes were

enriched with 8 sandalwood seeds per tree. An additional 15 spots of bare ground were also sown with 4 seeds per spot.

Height and crown dimensions of all plants seed enriched within the fenced plots on Burnerbinmah and Thundelarra were all measured. A similar number of plants of the same species were also measured outside the fenced plots. These plants were not seed enriched and were measured to quantify the effect of grazing.

Sandalwood size structure

Sandalwood trees were examined from eight populations on Burnerbinmah and six populations on Thundelarra. The number of trees in each population ranged from 10 to 48 trees. A total of 324 trees on Burnerbinmah and 100 trees on Thundelarra were measured. Each population examined was found growing on separate land types (Table 2).

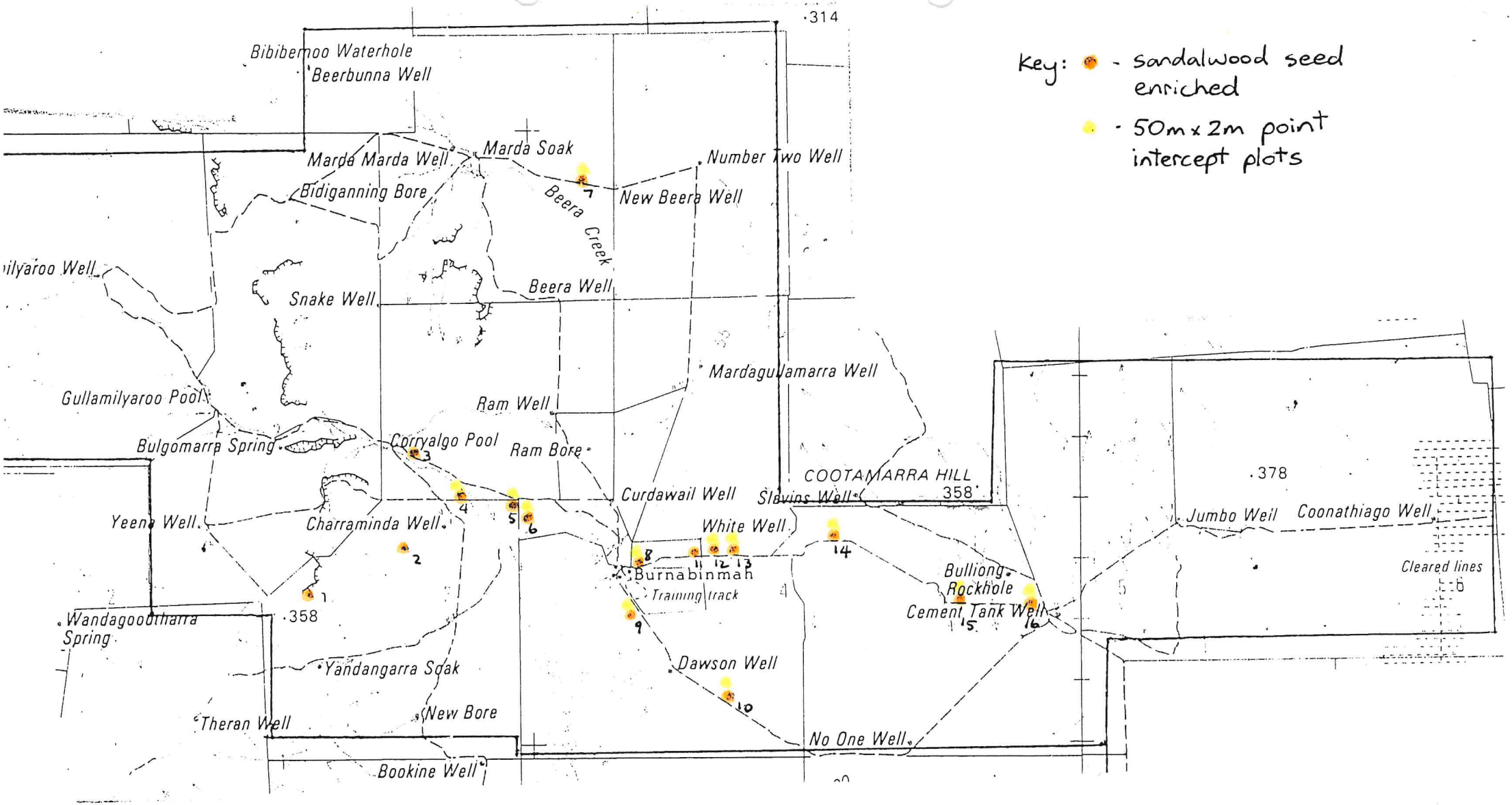
Table 2. Land type, tree number and location of each sandalwood population examined on Burnerbinmah and Thundelarra.

Population	Land Type	Number of trees	Latitude and Longitude
Burnerbinmah			
1 Sherwood	4	40	28° 47' 50" S, 117° 29' 14" E
2 Sherwood	4	38	28° 47' 24" S, 117° 16' 16" E
3 Kalli	12	48	28° 46' 54" S, 117° 23' 08" E
4 Kalli	12	37	28° 43' 53" S, 117° 29' 15" E
5 Woodline	13	40	28° 40' 44" S, 117° 20' 50" E
6 Woodline	13	37	28° 49' 34" S, 117° 24' 09" E
7 Ero	17	36	28° 47' 04" S, 117° 21' 52" E
8 Ero	17	48	28° 45' 19" S, 117° 18' 17" E
Thundelarra			
1 Sherwood	4	10	28° 53' 38" S, 117° 27' 10" E
2 Sherwood	4	15	28° 50' 04" S, 117° 24' 50" E
3 Woodline	13	20	28° 48' 05" S, 117° 14' 57" E
4 Woodline	13	22	28° 50' 14" S, 117° 13' 06" E
5 Woodline	13	18	28° 51' 30" S, 117° 11' 02" E
6 Roderick	17	15	28° 52' 35" S, 117° 25' 06" E

Tree height, height to crown, crown size and stem diameters were recorded from each sandalwood tree studied. Tree height was measured to 1 cm using a measuring pole. The height to the crown was measured to 1 cm using an 8 m tape and was defined as the distance from the base of the tree to the lowest green leaf. The north-south and east-west crown dimensions were measured to 1 cm using a compass and an 8 meter tape. Stem diameters were measured to 1 mm using a tree diameter tape. Stem diameters were recorded at 15 cm, 50 cm and 130 cm from the ground. All sandalwood trees were tagged and their positions within each population mapped.

Profile plots

Point intercept plots were established on Burnerbinmah and on Thundelarra. On Burnerbinmah, three 50 m * 2 m transect plots were established on each of the four different land types (ie. Sherwood, LT 4; Kalli LT 12; Woodline LT 13; and Ero and Roderick, LT 17). On Thundelarra, one transect plot was established on each of the four land types. The identification and frequency of each plant species were recorded at 250 different intercept points within each plot. Each plot was also photographed for a visual record.



Sandalwood seed enrichment sites and point intercept plots on Burnerbinmah.