Appendix No. 8.

062104

Inspection of Gnangara Plantation Area
6th to 10th January, 1925.

In 1916, the late Conservator, Mr. C. E. Lane-Poole, first considered the country round Lake Nangara as a Pine planting proposition. The main idea being to concentrate softwood production in this one place and carry out establishment work on such a scale as to be able within 30 to 40 years to supply the needs of the State.

The first actual sowing and planting work with Pinus pinaster was carried out in about 1 acre in 1918 and since then small experiments have been made almost yearly. The results to date are more or less unsatisfactory, and have not warranted working on a more extensive scale.

Between the 6th and 10th January, 1925, I made an inspection of the area with the object of arriving at a finality as to the future of this project (See Vol. IV., p.28 para. 3).

The country is typical undulating coastal sand plan. The tree vegetation consists of Banksia, intermingled with a small amount of E. marginata and E. Todtiana and a few E. calophylla. The main growth on the wetter portions (swamps during the winter months) is a form of ti tree.

1918 Experiments.

For Plan see File Vol. 1 p.66. Reports by District Ranger Shock and Mr. Ken, Hamel, see Vol. 1 p.86, 87, 89 and Vol II, p.14, 33, 46.

The experimental area, about 1 acre, was divided into four blocks of which -

(a) was cleared, grubbed and ploughed.

(b) timber cut level with the ground and removed.

(c) trees ringbarked.

(d) trees left in natural state.

These four blocks were again divided, one half being sown on the 23rd April, the other planted with stock from Hamel.

The sown blocks were resown on the 9th July due to poor germination.

The plants originating from this experiment dwindled in number and health during the next few years and today there is no trace of Pinus pinaster in this area.

A fire may have assisted in killing off the last plants on planted area, which to judge from reports were p and few in number. The seedlings disappeared altogethe

the first two years.

Simultaneously with the establishment of these experiments, Mr. Barlow planted 96 Pinus pinaster transplants on his property, and of these twenty or so are still alive and now growing vigorously. Some of the trees now being 10 to 15 feet high.

1919. Experiments.

See Mr. McVicar's report Vol.11 p.64 -67, and Mr. Lane-Poole's report, Vol.11, p.85.

On cleared and ploughed land on Barlow's farm one acre was selected and divided into four parts which were sown (broadcasting) with varying quantities of seed, 8, 16, 24, 32 lbs. per acre.

The seed germinated, but no seedlings survived the second summer.

There are no traces of plants from these experiments now.

1921 Experiments.

Mr. Lane-Poole's instructions 26/10/20, Vol.11, p.81

Mr. McVicar's report Vol. 11, p.93

Requisition of plants from Hamel, Vol.111 p.7.

Mr. Weston's report, Vol.111, p.18.

Mr. Kessell's report of 18/8/21, Vol.111 p.19.

Mr. Brockway's report 30/1/22, Vol.111 p.22-31
" " 21/1/23, Vol.111 p.87-98.

Mr. Gray's report of 3/12/23, Vol.1V. p.13-16.

Mr. Perry's report of 10/4/24, Vol.1V, p.17-20.

Mr. Lane-Poole was not inclined to accept the previous year's disappointing results as final, and due to possible soil and aspect variations on the area carrying weight desired to carry out experimental plots of one acre each on various parts of the forest. These plots were subsequently cleared, ploughed, and sown during the early winter of 1921; A corner of each plot was planted up with 100-200 transplants from Hamel.

Seven plots were established -

Plot No. 1 on Compartment 121.
" " 2 " " 136.
" " 3 " " 132
" " 4 " " 133
" " 5 " " 33
" " 6 " " 13
" " 7 " " 103.

Sowing.

The resmlts have been practically uniform in all areas. In the open seedlings have disappeared totally. On all areas a few seedlings were found under dense coppice of Jarrah and E. Todtiana evidently having even the first year received some shade protection. These living seedlings were all very suppressed and spindly and were found growing on both ploughed and unploughed spots.

Planting.

30 to 75% of the planted material has survived and the bulk of these plants would now be growing vigorously if they were not continuously being de-budded by brush wallabys.

A detailed description of the various plots is as follows:-

Plot 1, Compt. 121.

No living seedlings to be found in the open. A few under coppice shelter suppressed, but living.

Plot 2. Compt. 136.

No trace of seedlings in open. One seedling well established under E. Todtiana coppice. About 50% of the transplants from Hamel in N.E. corner of plot are looking healthy, but are continuously being debudded by wallabys.

Plot 3, Compt. 132.

No trace of seedlings.

No planting done.

Plot 4, Compt. 133.

No trace of seedlings.

About 30-40% of the planted material still living. The majority is healthy, but badly nipped by wallabys. One plant was now 22" high and had put on 15" during the last two seasons.

Plot 5, Compt. 33.

All seedlings in the open had died, the exception being one found in an ash heap living, but looking very poor , and several growing amongst the planted plants which look fair.

Under E. Todtiana coppice several living, but suppressed seedlings were found. In the South Western corner several were found under Jarrah coppice and round an old Jarrah stump covered with coppice 15 seedlings were found. Under a coppicing Marri 5 seedlings were found.

All these seedlings were suppressed.

Of the planted plants 75% were still living. The majority healthy. All were continuously being debudded by wallabys.

Plot 6, Compt. 13.

All seedlings in the open had disappeared with the exception of a few among the planted plants which, for some reason or other, had survived. (Possibly side shade from surrounding timber).

A few suppressed individuals were found under heavy Jarrah coppice.

In the planted plot, about half the living plants had got away, and there was no trace of wallabys having interfered with this plot at any time.

Several plants now between 3' and 5'.

The stagnating individuals seemed to owe their lack of vitality to a mutilated root system and poor planting.

Plot 7. Compt. 103.

No trace of seedlings.

Plants planted in Northern corner of plot healthy, but very bushy through the buds being constantly nipped off.

A fire had this Christmas been through this country, but had not entered the plot, although surrounding it on all sides.

1922 EXPERIMENTS.

Acting Conservator's instructions 7/2/22, Vol.111 p.34.
" " " 17/3/22, Vol.111.p.38
Instructions to Hamel Nursery 7/2/22, Vol.111, p.35.
Clearing specifications Vol.111,p.47.
Plan of area. Vol.111, p.80.
Mr. Brockway's report 20/1/23, Vol.111,p.96.
Mr. Gray's report 3/12/23, Vol.1V, p.13-16.
Mr. Perry's report 10/6/24, Vol. 1V, p.21 - 24

Plot 1, Compt. 130. 5 acres.

Thinned, ringbarked and ploughed.

8 lbs. of seed sown per acre.

In Jan. 1923, 1876 good seedlings existed per acre.
1166 poor seedlings " " "

No living plants were found, and the few dead ones still remaining on the area all showed lacerations at soil surface due to excessive heat.

Plot 2, Compt. 123.

Thinned, not cleared and ploughed. The Western portion was sown with Pinus pinaster seed; the Eastern was planted.

No seedlings were sown.

In January, 1923, 1430 good plants were found per ac.
1166 poor " " " "

About 50% of the plants were still living (94% in January, 1923).

Plot 3, Compt. 123. 5 acres.

Cleared, ploughed and sown.

A small portion planted (was not seen by me).

January, 1923, 1166 good plants per acre.
638 poor " " "

January, 1925, No trace of seedlings.

Plot 4. Compt. 123 5 acres.

Not cleared, ploughed and sown.

Saw a few living plants in this plot, but all looked unhealthy, and suffered from sunburn sores on stem at about ground level.

1923. EXPERIMENTS.

Conservator's instructions 28/2/23, Vol.111, p.100.
" " 17/3/23, Vol.111, p.104
Mr. Brockway's report 29/3/23 Vol.111, p.107-110
Specification of work, Vol.111, p.101.

Plot A, Compt. 124. 19 acres.

The Banksia stand was thinned and the remainder of the trees were ringbarked. The area was then ploughed and cross-ploughed and sown down with 10 lb. P. pinaster per acre.

In January, 1925, the position is as follows:-

Counts on 92 circular sample plots distributed over the whole area were made with the following results:-

42 dead plants per acre	7658	dead.
6 poor " " "	849	poor
1 good " " "	145	good.
Total -	8652	

Remarks.

Nine good seedlings were found under an unrung E. Todtiana in the North-West corner of a block.

The bulk of the dead and dying plants were visible suffering from sores round stems at about ground level. This is undoubtedly due to excessive heat of surface soil.

Plot B. Western portion of 123.

Timber thinned and ringbarked, then ploughed and harrowed during the latter part of summer. 10 lbs P. pinaster sown per acre.

Counts were made on 38 circular plots (each of 3.27 sq. ft.) distributed evenly over the area in question.

45 dead plants	1 acre	15,770 dead
10 poor "	"	3,504 poor
- good "	"	- good
	Total	19,274

Remarks.

Germination was good, but survival practically nil after the first and half of second summer.

In the South-West corner four healthy somewhat suppressed seedlings were found under E. Todtiana coppice.

On the Eastern boundary at top of hill 25-30 seedlings 6 to 8 inches high were found in a somewhat suppressed state under E. Todtiana coppice. Dead and dying plants visibly suffering from sun scald at ground level.

Plot C.

Central portion of Compartment 117.

Timber thinned, then remainder ringbarked. The area was then, during the latter part of the summer, ploughed and harrowed and after the first rains sown with 10 lbs. P. pinaster seed per acre.

Counts on 100 (each of 3.27 sq. ft) plots distributed over the area gave results as follows:-

32 dead seedlings	1 acre	4,264 dead
21 poor "	"	2,797 poor
1 good " (surrounded by leaf litter)		133 good
	Total.	7,194

Remarks.

Suppressed seedlings were again found here and there under coppice and surrounded by litter.

The North-Western corner (2-3 acres) had been burnt over this summer, probably by hunters at Christmas time.

Dead and dying plants with visible sores at ground level very numerous.

Plot D. 10 acres. Compt. 117.

Area ringbarked and ploughed one way. Planted with transplants from Hamel.

The greater part of the area was burnt December, 1924. About 2 acres in north-eastern corner escaped; on this about 10% of the plants are living. The majority looking poor.

Plot E. Eastern portion of Compt. 123. Area 5-6 acres.

Cleared. No cultivation.

Planted with transplants from Hamel.

Only found three living plants on whole area.

Summary.

Sowing Experiments.

Right through the whole series the results have been the same, viz.- Germination good, but there has been, practically speaking, total destruction of all exposed seedlings during the first two summers of their existence. Exceptions being a few seedlings which accidently have been protected from excessive surface heat by coppice or other shelter.

Various forms of cultivation, (ringbarking and clearing) have had no visible effect on the results.

Deductions.

The main reason for failure appears to be destruction, or partial destruction, of the cambial sheath caused by excessive heat of surface soil during the summer months.

Soil moisture and conservation of soil moisture seems to have been the main consideration in the past, but the fact that seedlings have been able to exist amongst coppice in close proximity to stumps, when the root competition must be heavy, seems to point to the fact that shortage of soil moisture during the summer is of minor consideration compared with protection of the young stem from the hot sands.

Planting.

The 1918 results on Barlow's farm show that some success can be obtained even on comparatively high country. Also that once the trees are established and are able to protect the soil round their base rapid and vigorous growth takes place.

The subsequent years' planting is promising when weak points are taken into consideration. Planting material has invariably been heavily wrenched transplants from Hamel, and numerous eximations of the dead and dying material in the field seemed to indicate phorly carried out planting as the general rule. Particularly is this the case with planting carried out in 1923.

The main reason for the partial success with planted material is, in my opinion, due to the older plants having a greater protection of the cambial sheath, and not to greater root penetration during the first couple of years.

Recommendations.

Planting should be the main means of extending the plantations at present, and the weakness of obtaining stock from Hamel must be lifted by making a thorough attempt at raising stock locally.

Seed should be sown in May.

Suitable shading methods should be used during the first, and if necessary the second, summer also. Wide meshed light netting will probably be suitable material on which to lay brush shades.

Watering will, perhaps, be found to be unnecessary.

If possible, seedlings one year old should be used.

Sowing is undoubtedly the cheapest method of establishment, and also has other good points provided it can be successfully carried out.

Spot sowing on cleared and uncleared ground should be tested on a small scale at present. Towards the end of the winter, when the young seedlings have been fairly well established, an attempt at insulating the stems should be made with circular bits of cardboard 2 to 3 inches in diameter.

A small hole should be punched in the centre and the disc cut from centre edges. By slipping these cardboard discs round the stem of the most promising seedlings, or seedlings, in each hole, it may be possible to keep the growth going the first year or two, which is necessary to carry the plants through their critical period.

It may be worth while treating some of the one-year old planted material in a similar way.

Perhaps it will be advisable to impregnate the discs with varnish or paraffin.

Various colourings should also be tested.

Housesite for an overseer should be located on Barlow's old farm.

Nurserysite should also be located here in saddle between the large swamp and a small seepage to the S.W. of Barlow's old housesite.