WATER AUTHORITY OF W.A.

REAFFORESTATION P.85

PLANTING REPORT

By Stephen Quain

CONTENTS PAGE

	INTRODUCTION	1
1.0	PLANTING AREA PREPARATION	2
1.1	Soil Survey	2
1.2	Stag Falling and Deep Ripping	2
1.3	Ripping and Mounding	3
1.4	Roading	3
1.5	Spraying of Mounds and Rip Lines	4
1.6	Fencing	5
2.0	TRANSPORT	6
2.1	Officer Transport	6
2.2	Employee Transport	6
2.3	Seedling Transport	6 7
3.0	PLANTING	8
3.1	Stocking	8
3.2	Species Selection	8
3.3	Species Used for the 1985 Planting Season	8
3.4	Standard of Seedling	9
3.5	Planting Operation	9
3.6	Ricetti Trial Area	10
4.0	FERTILIZING	11
4.1	Storage of Fertilizing	11
4.2	Fertilizing Seedlings	11
4.3	Comletion of Fertilizing	11
5.0	RECOMMENDATIONS	12 13
6.0	COSTING OF P.W.D. PLANTING INCLUDING	
	TABLE 1 - C.A.L.M. ACTUAL COSTING	
	TABLE 2 - APPROXIMATE P.W.D. COSTS ACTUAL	
	TABLE 3 - TOTAL C.A.L.M. & P.W.D. ACTUAL	
	TABLE 4 - C.A.L.M. COSTING & OVERHEADS	
	TABLE 5 - APPROXIMATE P.W.D. COSTS ACTUAL	
	TABLE 6 - C.A.L.M. COSTING & OVERHEADS & P.W.D. COSTING	

INTRODUCTION

The programme for reafforestation and fertilizing, the Wellington Catchment for 1985 totalled approximately 800 ha over four farms. These farms were Maxon, Ewens, Ferrarri's and Gibbs.

For the first time in the programme a D7 dozer was used to push and heap stags within certain areas e.g. Ferrarri's, Maxon Farm and Ewens. It also carried out deep ripping on approximately 25 ha of heavy laterite rock on Maxon Farm. Both operations proved to be successful.

A total of fourteen Eucalypt species plus a Tamarix, a Casuarina and a Melaleuca were ordered from the Manjimup nursery. A species of Saltbush was to be raised by the Agricultural Department in Narrogin. For unknown reasons a number of these species were unavailable for the planting season. A total of approximately 400,000 trees were raised for the 1985 programme.

Planting and Fertilizing was completed well before the expected time, finishing at the end of August. The number of people employed on the programme averaged around fifteen.

...../2

1.0 PLANTING AREA PREPARATION

1.1 Soil Survey

A detailed soil survey was carried out over the 800 ha on a grid pattern. Lines were run across the contour when possible at 200 m apart with 100 m spacing between the holes. Holes were dug to a depth of 90 cm where possible. A tractor with a post hole borer was used, with a driver and officer. It was started on the 12th November on the Gibbs property and was completed on the 11th January. Eighteen working days were used in the field and eight days were used in the office to map it.

Boundaries in the majority of times were not demarcated suitably in the field, and a great deal of time was spent on finding boundaries. A few boundaries were estimated of the very small scale maps we were given. Parts of Ewens and Gibbs farms were under crop, subsequently boundaries were difficult to find, and in some cases areas were left unsurveyed due to the damage we would cause and also the fire risk. Whittington banks within Maxon Farm caused problems in that, they were too high to cross, so in some cases the normal across the contour procedure could not be used.

Overall approximately 80% of the soil surveyed fell within the B classification of: Light Brown, Yellow and Grey, Sandy, Loamy Gravels. This is a vast improvement of soil quality to P.84, largely due to the fact that we planted a lot less of the flatter, saline waterlogged areas.

1.2 Stag Falling and Deep Ripping

A D7 dozer with a tree arm was used to push and heap the stags within the Ferrarri's, Maxon Farm and Ewens planting areas, during March and April.

...../3

This proved to be of great value, cleaning up the planting areas considerably. The heaps were later burnt in late April and early May with very little remaining and creating ideal ash beds, for growing seedlings.

The D7 was also used for deep ripping an area of 25 ha, consisting of heavy laterite rock in Maxon Farm. This area could not be effectively ripped by our own tractors and damage could have resulted. The cost of the D7 dozer for these two operations was $13,890.

1.3 Ripping and Mounding

The operation started on the 8th January and finished on the 24th April, comprising of 70 working days. It was completed with three tractors, two with rippers and one with a mound plough.

A shortage of ripping points and bolts proved a problem throughout the operation but only slowed down progress marginally.

1.4 Roading

Started on the 21st January and was completed on the 22nd March. Contractors were to be Carbone Bros., who supplied two tip trucks, a loader and a grader. The C.A.L.M. Department constructed all the causeways and located all the pipes required, with a 930 loader and tip truck.

Most of the roading was carried out in the Ferrarri's property, mainly due to its limited existing access, and its low lying topography. Roading was also carried out in the Maxon Farm property and Ewens property with a main causeway constructed at each of these sites.

...../4

Overall the roading was of an acceptable standard and only minimal follow up maintenance had to be carried out, usually after heavy rain. Bogging was never a problem on the roads constructed. Thirty nine thousand, four hundred and eighty four dollars was spent on roading this year entailing C.A.L.M. costing and overheads and P.W.D. costing.

1.5 Spraying of Mounds and Rip Lines

Spraying started on the 26th April at Ferrarri's and was completed in late June. Three tractors were used, one with dual wheels. A pre-emergent herbicide called Gesaprim was initially used on the mounds at Ferrarri's and Maxon Farm but due to grass and weed growth, we ceased to use it on the 11th May. We then opted for the post-emergent herbicide Amazine A.A. Due to the late break in the season we had very little trouble bogging even without the dual wheels, which had played havoc the previous year. During May we found that the pre-emergent herbicide Gesaprim had been unsuccessful in Ferrarri's, so it was resprayed with Amazine A.A., to get the required result.

A communication problem existed between the P.W.D. and the land owners and lessees of the properties. On numerous occasions sheep existed in paddocks, that we had planned to spray. This caused delays in our propramme. A major factor behind this was due to the late break in the season, most of the green feed existed in the lower slopes where we were to spray, so the owners were reluctant in some cases to move their sheep from the areas. The problem was later rectified to a degree with the C.A.L.M. Department taking over responsibility of notifying the owners themselves.

Amazine A.A. proved to be effective in spraying the mounds and rip lines for reducing grass and weed competition before planting commenced.

1.6 Fencing

Fencing of the areas was carried out by the farmer or by a contractor. Fencing in the majority of cases was completed after planting, which caused problems regarding sheep.

During the planting season we had to abort our original plans in some cases, and move to another area because of the presence of sheep. Lack of communication seemed to be the main problem which was later rectified. More gates could have been installed within the planting areas, namely Ewens, which causedproblems in regard to access for delivering plants and for transporting our planters.

...../6

2.0 TRANSPORT

2.1 Officer Transport

A Nissan 4x4 King Cab was the vehicle used for transport around the planting area. The vehicle proved to be very capable with the wide B.F. Goodrich Radial Mud Terrain T/A's which aided flotation greatly. These tyres are necessary as the vehicle often helps in the delivery of trees and equipment in tandem with a tractor or when the tractor was unavailable or bogged. The vehicle coped better than the tractor in the wetter areas, because of the extra flotation.

2.2 Employee Transport

A bus was supplied by the P.W.D. for gang transport. This bus proved inadequate as the condition of the bus meant fumes entered the bus causing health problems. The bus was repaired, but the problem arose again after the bus was changed over, after blowing its motor. The new bus was repaired. Neither of these problems should have arisen, and a great deal of time was spent on organizing for it to be repaired and organizing alternative transport. Overall condition and performance of the buses I think were inadequate.

2.3 Seedling Transport

A single wheeled tractor was used in tandem with the Nissan 4x4 ute for the majority of the planting season until the hiring of the four wheel motorbike. The tractor proved inadequate as it was too heavy, becoming bogged on numerous occasions. Time was then spent trying to extract it, at the expense of planting. The tractor was able to carry 30 trays and the Nissan 4x4 ute 22 trays. In some situations it was too risky to deliver trees to some areas, so the trays had to be carried over to the planters, wasting time.

Towards the latter end of the planting season the P.W.D. hired a four wheel motorbike. With alterations to the front and back carriers the motorbike could carry ten trays. The four wheel motorbike proved to be the ideal vehicle, for the job. Bogging was no longer a problem, as the "few" times it did bog, it was easily lifted out. Even though it could only carry ten trays, on most occasions it was able to keep plants up to the seventeen planters used. Further modification to the carriers (easily done) could increase its capacity to sixteen trays. Overall running costs for the machine must find it a long way ahead of the tractor. Operation of the machine was simple and its manoeuvrability excellent, and its purchase has helped in streamlining the planting operation.

...../8

3.0 PLANTING

3.1 Stocking

The stocking was as last year, 500 trees per hectare with the 5th row left out, leaving an 8 m gap after the 4th row. A 4th row species was to be planted this year, and in some cases was (Maxon Farm), but it was realized later on that the original nursery stock ordered was not based on using a 4th row species. So it could not be carried out properly with the existing nursery stock.

3.2 Species Selection

Species were selected for site suitability on the following 3 classes:

1. Lower Slope.
2. Mid Slope.
3. Upper Slope.

Species selection does not intergrate with soils which is unfortunate due to the fact that the P.W.D. has never given us a year's notice of the planting area in advance. We need this so we can survey the areas a year ahead of planting and get our nursery requirements in (around September) so species selection can also depend on soil.

3.3 Species Used for the 1985 Planting Season

Euc. wandoo	Upper, Mid and Lower Slope
Euc. viminalis	Mid Slope
Euc. saligna	Lower Slope
Euc. sideroxylon	Upper and Mid Slope
Euc. resinifera	Upper and Mid Slope
Euc. camaldulensis	Lower Slope
Euc. cornuta	Lower Slope
Euc. sargentii	Lower Slope
Euc. largiflorens	Lower Slope trial area Ricetti's
Euc. accedens	Upper Slope
Euc. platypus	Lower Slope trial area Ricetti's
Mel. priessi	Lower Slope trial area Ricetti's
Cas. obesa	Lower Slope trial area Ricetti's
Mel. cuticularis	Lower Slope trial area Ricetti's

3.4 Standard of Seedling

The standard of seedlings from the nursery were very good. Size and health of all species were satisfactory.

Out of the 1985 nursery stock requirements 7 species of seedlings were unavailable and no notice of this was given until we had started planting. This meant that some species of trees were planted in areas not according to the original plan which was laid down earlier in the season. As a result more Wandoo and Resinifera (surplus from Manjimup Nursery) were planted than originally planned. The species which were unavailable were:

Euc. wandoo (Salt Tolerant)
Euc. mannifera
Euc. largiflorens - only 1000 available out of original 9100
Euc. microcarpa
Tamarix
Casuarina glauca
Saltbush

3.5 Planting Operation

No stoppages arose during the season of any great significance. Numbers of planters varied from 10 to 17 with two overseers and one officer supervising.

Planting started on the 11th June at Maxon Farm and was completed on the 24th July on Gibbs property. Time taken was 31 working days which is comparatively quick to the previous year. This was largely due to the better ground for planting and the increased amount of people used for planting. The weather was good and the attendance of planters was acceptable, with no lost time accidents occurring, within the gangs.

...../10

3.6 Ricetti Trial Area

An area of approximately 3 ha was used in Ricetti's as a trial area. The area concerned was severely waterlogged and saline. A trenching machine was used to dig large mounds roughly 4' tall, leaving a channel between the mounds. A large channel was also dug down the centre of the trial area to reduce waterlogging. Plant spacing was 2 m in between the plants and 5 m in between the rows.

Species planted were:

Euc. cornuta
Euc. platypus
Euc. camaldulensis
Euc. sargentii
Cas. obessi
Mel. pressiana
Euc. largiflorens
Mel. cuticularis

Many problems were associated with planting and fertilizing the trial area. Some mounds were washed away completely, others affected greatly. It was very difficult to transport trees or fertilizer around the area. The channels of water were deep and muddy so access was limited. Trees in some cases had to be thrown over to planters, not the ideal situation. The pointed top on the mounds and steeply sloping sides meant they were hazardous to plant and fertilize in which twisted ankles could occur easily. The trial area was fertilized the same way as the rest of the planting area, with 100 grams of Agras.

...../11

4.0 FERTILIZING

4.1 Storage of Fertilizing

Prior to planting 40 tonnes of Agras arrived at Boolading siding for storage. Fertilizer was stored at Maxon Farm, Souths and Ricetti's. Storage was adequate and the access to them, caused no problems.

4.2 Fertilizing Seedlings

Each seedling receives 100 grams of Agras No. 1, usually around 4 weeks after planting.

4.3 Completion of Fertilizing

Fertilizing started on the 25th July at Maxon Farm and was completed at Gibbs on the 30th August.

...../12

5.0 RECOMMENDATIONS

There was a lack of communication between C.A.L.M./P.W.D. and the farmers early in the season but I think it was largely rectified from then on, once C.A.L.M. took responsibility for notifying the farmers of our operations. Below is a few recommendations which would streamline the reafforestation programme.

1. Planting area to be surveyed and suitably marked in field, prior to soil survey.

2. Fencing to be completed prior to planting to keep stock out of areas.

3. Continue use of motorbike and B.F. Goodrich Mud Terrain T/A's.

4. Communication with farmers to lay as much as possible with forest officer, for more efficient planning and organizing.

5. Standard of transport for wages employees would want to improve, considering the mechanical and fume problems we had this year.

6. No cropping to be carried out on planting areas prior to planting. Makes it difficult for soil survey (finding pegs, fire risk, to dig holes). Impossible to rip or mound when under crop.

7. A higher standard of maps with boundaries on them would be useful for plotting species boundaries throughout the planting season. (1:10,000)

8. A few more gates for access would have been useful.

...../13

9. Dozer to continue in areas where stags prevail or where there is heavy rock.

10. Keep in contact with nurseries to make sure the species are available for the coming planting year.

11. Boundaries of planting areas need to be rationalized. Some areas are not practical.

6.0 COSTING OF P.W.D. PLANTING

TABLE 1 - C.A.L.M. ACTUAL COSTING

	MATERIALS	WAGES	PLANT	TOTAL	Ha	COST PER HA
Soil Survey		1,251.00	3,002.00	4,253.00	800	$ 5.31
Roading		5,156.00	7,248.00	12,404.00	800	$ 15.50
Preparation		14,853.00	17,345.00	32,198.00	800	$ 40.25
Spraying		9,056.00	7,402.00	16,458.00	800	$ 20.57
Planting & Fertilizing	1,863.00	56,735.00	14,888.00	73,486.00	800	$ 91.86
Total	1,863.00	87,051.00	49,885.00	138,799.00	800	$173.99

TABLE 2 - APPROXIMATE P.W.D. COSTS ACTUAL

	MATERIALS	CONTRACT	PLANT	TOTAL	Ha	COST PER HA
Roading	1,820.00	20,800.00		22,620.00	800	$ 28.27
Preparation		21,890.00		21,890.00	800	$ 27.36
Spraying		8,848.00		8,848.00	800	$ 11.06
Planting & Fertilizing	65,718.00	3,582.00		69,300.00	800	$ 86.63
Fencing		22,589.00		22,589.00	800	$ 28.24
Total	67,538.00	77,709.00		145,247.00	800	$181.56

TABLE 3 - TOTAL C.A.L.M. & P.W.D. ACTUAL

	MATERIALS	CONTRACT WAGES	PLANT	TOTAL	Ha	COST PER HA
Soil Survey		1,251.00	3,002.00	4,253.00	800	$ 5.32
Roading	1,820.00	25,956.00	7,248.00	35,024.00	800	$ 43.78
Preparation		36,743.00	17,345.00	54,088.00	800	$ 67.61
Spraying		17,904.00	7,402.00	25,306.00	800	$ 31.63
Planting & Fertilizing	67,581.00	60,317.00	14,888.00	142,786.00	800	$178.48
Fencing		22,589.00		22,589.00	800	$ 28.24
Total	69,401.00	164,760.00	49,885.00	284,046.00	800	$355.06

TABLE 4 - C.A.L.M. COSTING & OVERHEADS

	MATERIALS	WAGES	PLANT	TOTAL	Ha	COST PER HA
Soil Survey		1,981.58	3,602.40	5,583.98	800	$ 6.98
Roading		8,167.10	8,697.60	16,864.70	800	$ 21.08
Preparation		23,527.15	20,814.00	44,341.15	800	$ 55.43
Spraying		14,344.70	8,882.40	23,227.10	800	$ 29.04
Planting & Fertilizing	2,235.60	89,868.24	17,865.60	109,969.44	800	$137.46
Total	2,235.60	137,888.77	59,862.00	199,986.37	800	$249.98

TABLE 5 - APPROXIMATE P.W.D. COSTS ACTUAL

	MATERIALS	CONTRACT	PLANT	TOTAL	Ha	COST PER HA
Roading	1,820.00	20,800.00		22,620.00	800	$ 28.27
Preparation		21,890.00		21,890.00	800	$ 27.36
Spraying		8,848.00		8,848.00	800	$ 11.06
Planting & Fertilizing	65,718.00	3,582.00		69,300.00	800	$ 86.63
Fencing		22,589.00		22,589.00	800	$ 28.24
Total	67,538.00	77,709.00		145,247.00	800	$181.56

TABLE 6 - C.A.L.M. COSTING & OVERHEADS & P.W.D. COSTING

	MATERIALS	WAGES CONTRACT	PLANT	TOTAL	Ha	COST PER HA
Soil Survey		1,981.58	3,602.40	5,583.98	800	$ 6.98
Roading	1,820.00	28,967.10	8,697.60	39,484.70	800	$ 49.36
Preparation		45,417.15	20,814.00	66,231.15	800	$ 82.79
Spraying		23,192.70	8,882.40	32,075.10	800	$ 40.10
Planting & Fertilizing	67,953.60	93,450.24	17,865.60	179,269.44	800	$224.09
Fencing		22,589.00		22,589.00	800	$ 28.24
Total	69,773.60	215,597.77	59,862.00	345,233.37	800	$431.54