OIL MALLEE PROPAGATION REPORT

Selecting and breeding the high cineole oil mallee trees is a key factor to the economic viability of the oil mallee project. Married with the high cineole content must be the ability for the plant to produce copious amounts of leaf material from which the oils can be produced and extracted.
To accelerate the benefits of using high cineole trees with acceptable vigour in the tree farm landscape, two options have been pursued to multiply the selections, an asexual method of mass propagation through tissue culture and a sexual production method of out-crossed seed from vegetatively propagated high cineole trees.

1. Tissue culture.

The tissue culture techniques were first investigated by Murdoch University under the guidance of Prof McComb. Ten tubs of 5 clones were handed over in 1992 and after some teething problems with hardening-off the material the technique is, at last beginning to show promise.
The question that plagues the future of this technique is, if through the propagation process, the ability of the roots to form a lignotuber is lost. This is critical for the survival of the tree through the harvesting process.

Clone	Growth room status	Hardening-off for P95	Planted P94
EO1	3 tubs multiplication	198	20
EO2	*lost*	0	0
EO3	3 tubs multiplication	220	0
EO4	*lost*	0	0
EO5	3 tubs multiplication	180	16
E06	30 initiated	0	4
EO7	20 initiated	0	0
EO8	58 initiated	0	0
	Total	598	40

A small number of clonal plants from Murdoch were passed on to the Agricultural department for trial establishment.

2. Grafting

Grafting was investigated for the capturing of the high oil yielding parents for the establishment of orchards to encourage out-crossing.

2.1 1993 rootstock

Clone	Species	cineole content fwt	Date	Grafted	% Strike 30/5/94	% Strike 20/12/94	Plantable
011133P	polybractea	3.18	4/5/94	18	*	5.5	1
011136P	polybractea	3.45	4/5/94	16	*	**31.25**	5
613P	polybractea	2.4	4/5/94	17	*	**29.41**	5
620P	polybractea	2.9	28/4/94	38	*	7.89	3
623P	polybractea	2.8	28/4/94	38	*	**36.84**	14
PBA100P	polybractea	2.97	4/5/94	18	*	0	0
KK545	kochii		2/2/94	50	60	**48**	24
KK582	kochii		2/294	50	74	12	6
KK593	kochii		3/2/94	49	65.3	4.08	2
KPL8717	plenissima		10/2/94	50	42	22	11
KPL9090	plenissima		11/2/94	49	75.5	**55.1**	27
KPL9094	plenissima		10/2/94	50	68	22	11
TCB01H	horistes		24/2/94	39	97.4	**43.58**	17
TCB22H	horistes		24/2/94	37	62.2	13.51	5
TCB38H	horistes		24/2/94	37	54	**45.94**	17
TCB4OH	horistes		24/2/94	39	84.6	**28.2**	11
				595			159

Overall grafting was 26.72% for rootstock raised in 1993.

2.2 Rootstock 1994

In 1994 1000 rootstock (250 of each species) were potted at Wanneroo form seedlings raised at the Narrogin nursery. Not all the rootstock have been used to date and they are now becoming too old for use. The rootstock left are: 150 polybractea, 188 horistes, 127 plenissima and the full 250 of kochii.
To date the grafting completed is as follows. One set of scion were discarded as they were in a poor state on arrival.

Clone	Species	cineole content fwt	date	# grafted	% strike 20/12/94
P842	Polybractea		29/9/94	10	80
P850	Polybractea		29/9/94	10	100
P852	Polybractea		29/9/94	10	90
P854	Polybractea		29/9/94	10	100
P856	Polybractea		29/9/94	10	70
P859	Polybractea		29/9/94	10	100
P864	Polybractea		29/9/94	10	90
P865	Polybractea		29/9/94	10	70
P867	Polybractea		29/9/94	10	80
P885	Polybractea		29/9/94	10	70
PL452	Plenissima		7/10/94	10	30
PL453	Plenissima		7/10/94	10	30

PL458	Plenissima		7/10/94	10	0
PL701	Plenissima		7/10/94	10	30
PL702	Plenissima		7/10/94	10	50
PL704	Plenissima		7/10/94	10	50
PL707	Plenissima		7/10/94	10	40
PL708	Plenissima		7/10/94	10	60
PL709	Plenissima		7/10/94	10	70
PL714	Plenissima		28/10/94	10	0
PL729	Plenissima		28/10/94	10	0
PL733	Plenissima		28/10/94	10	0
TCB46H	Horistes		13/10/94	10	70
TCB74H	Horistes		13/10/94	10	40
WBE634H	Horistes		13/10/94	10	10
WBE644H	Horistes		13/10/94	10	0
WBE647H	Horistes		13/10/94	10	0
WBE662H	Horistes		13/10/94	10	30
				280	48.57%

The overall grafting success to date is 48.57%. We feel that this could be improved with the scion being delivered earlier in the year and as quickly after being collected as possible. To overcome this problem, the successful grafts could be used as mother plants for scion so that each clone can be multiplied.

3. The Accelerated orchard.

A number of the clones have been established in a fenced area at Como (attachment). The tissue culture plantlets or grafts are potted into 45 litre handled bags and slightly dug into the ground. Each plant is attached to drip irrigation which is switched on every other day in the summer and switched off in the winter. Once the trees are established they will be treated with paclobutrazol (if the experiment proves its use assists flowering) and the flowers that form will have controlled pollination's performed on them. Two of the clones have flower buds appearing.

4. Collection of pollen

In 1994 whilst the polybractea scion was being collected for grafting, additional branches were collected for pollen collection. The branches were brought into the laboratory, placed into water and the open flowers removed. From the next day onwards the pollen was collected, dried, sieved and stored. Pollen viability will be tested and the pollen used in the accelerated orchard.

5. Testing paclobutrazol for accelerated flowering of the oil mallees.

An experiment was established investigating the effect of paclobutrazol on the flowering of one year old oil mallee seedlings. The four species have been grouped into blocks and each block is being treated per month. This will define the best time of

paclobutrazol application as well as determining whether the chemical works. The experiment started November 1994.

Assistance with this program:
Bev Boyer and Evelyn Ross, the grafting at Wanneroo
Wally Edgecoombe, the collecting of the scion and pollen
Trevor Butcher designing and controlling the Grafting Information System
Rada Tomanovic, the tissue culture at Como
Chris King, the accelerated orchard and paclobutrazol experiment at Como

Dr Liz Barbour
22/12/94

Accelerated orchard design as 20/12/94

Como AFO oil malee plan							
Total number planted = 78							
* denotes flowering							
	CLONE				CLONE		
	EO 1	oooo	oooo	oooo			
	EO 1	oooo	oooo		EO 5	oooo	oooo
	623P	o			EO 5	oooo	oooo
	KPL 9090	o			EO 6	oooo	
	TCB 22 H	ooo			TCB 38 H	oooo	ooo
	TCB 40 H	oooo			KPL 8717	oooo *	
	KK 582	o					
	KK 545	oooo	oooo		TCB 01 H	oo	
	KK 545	oooo	ooo				