Herbicide Tolerance of Melaleucas and Oil Mallees on a Sandplain Seepage at Bunjil.

Aim: To examine the tolerance of Melaleucas and oil mallees to a range of herbicide treatments.

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Location: Rabbit Proof Fence Road, Bunjil

Background: CALM is currently screening a number of species of *Melaleucas* that have been identified as having commercial potential for leaf oil and biomass production. Unlike oil mallees, *Melaleucas* have the added advantage of being tolerant to saline conditions and could offer farmers another commercial option for salt affected soils.

Very little information is available on the tolerance of these plants to the herbicides commonly used in farming operations. This information is necessary not only from the point of view of spray drift onto trees from adjacent crops and pastures, but more importantly for weed control within the tree plantings. It is hoped that the results of this trial will shed some light on the effect that some chemicals may have on trees. **Please note that the herbicides used in this trial have no registration for use on these species.**

Trial Details:

Plot size and replication	6 m x 30 m – 3 replicates X 2 blocks top block (drier, less salt affected block) bottom block (wetter, closest to seepage)
Soil type	Sandplain seepage
Planting date	16/07/02 planted as seedlings
Spraying dates	Pre planting 16/07/02 and post planting 10/09/02
Species used	1. *Eucalyptus polybractea* 2. *E.loxophelba var. lissophloeia* 3. *E.plenissima* 4. *E.horistes* 5. *Melaleuca lateriflora variety 1* 6. *M. lateriflora variety 2* 7. *M. lateriflora variety 3* 8. *M.uncinata "spicate"* 9. *M. uncinata "stubby"* 10. *M.stereophloia*
Herbicide treatments (all surface applied)	1. Control 2. Roundup Max® @ 0.882 L/ha (equivalent to 1 L/ha Glyphosate 450 gai) **(post planting).** **3.** Stomp® 330 gai @ 6 L/ha **(post planting).** 4. Eclipse® @ 10 g/ha +Verdict 520® @ 100 mL/ha + Select® @ 250 mL/ha + Uptake® @ 0.5% **(post planting).** 5. Logran® @ 15 g/ha + Verdict 520® @ 100 mL/ha + Select® @ 250 mL/ha + Uptake® @ 0.5% **(post planting).** 6. Brodal® @ 300 mL/ha+ Simazine @ 6 L/ha **(pre planting).** 7. Brodal® @ 500 mL/ha **(pre planting)**
Spray application rate	84 L/ha
Assessment dates	10/09/02 and 18/10/02

Results:

Table 1. Weed suppression ratings, expressed as percentage controlled, 5 weeks after spraying post planting treatments and 13 weeks after pre planting treatments

Weed type	Glyphosate	Stomp	Eclipse+ Verdict+ Select	Logran + Verdict + Select	Brodal + Simazine	Brodal
ryegrass	53	27	85	93	97	0
capeweed	82	20	37	40	100	100
ice plant	97	43	50	77	100	100
salt spurry	88	63	30	67	100	100

Table 2. The survival rates (%) of seedlings at 5 weeks after spraying post planting treatments and 13 weeks after pre planting treatments. **Drier Top Block**.

Species	Control	Glyphosate	Stomp	Eclipse + Verdict + Select	Logran + Verdict + Select	Brodal + Simazine	Brodal
1. Eucalyptus polybractea	92	100	89	92	100	28	89
2. E.loxophelba var. lissophloeia	67	42	100	100	83	33	100
3. E.plenissima	72	85	93	100	92	0	72
4. E.horistes	83	71	76	88	100	8	50
5. Melaleuca lateriflora var 1	67	100	93	100	93	87	89
6. M. lateriflora var 2	92	93	83	100	93	87	100
7. M. lateriflora var 3	77	100	89	100	100	67	100
8. M.uncinata "spicate"	67	92	57	78	100	31	67
9. M. uncinata "stubby"	100	100	78	93	92	70	89
10. M.stereophloia	100	100	71	100	93	73	67

Table 3. The survival rates (%) of seedlings at 5 weeks after spraying post planting treatments and 13 weeks after pre planting treatments. **Wetter block closest to saline seepage**.

Species	Control	Glyphosate	Stomp	Eclipse+ Verdict + Select	Logran + Verdict + Select	Brodal + Simazine	Brodal
11. Eucalyptus polybractea	71	33	33	83	67	7	89
12. E.loxophelba var. lissophloeia	89	13	67	53	73	28	56
13. E.plenissima	50	47	44	66	28	67	67
14. E.horistes	83	67	98	67	77	0	33
15. Melaleuca lateriflora var 1	100	93	93	100	100	80	100
16. M. lateriflora var 2	80	93	85	100	78	93	100
17. M. lateriflora var 3	93	87	100	100	87	53	100
18. M.uncinata "spicate"	100	92	100	93	92	7	83
19. M. uncinata "stubby"	56	78	54	100	57	33	60
20. M.stereophloia	100	100	100	100	93	92	89

Interpretations/Comments:

On tree survival:

As expected on a saline site the *Melaleuca's* had the greatest survival compared to the *Eucalypt's*. Overall survival of *Eucalypt's* on the more saline block was 55% compared with 75% survival on the drier block. This compares with overall survival for the *Melaleuca's* of 85% on the more saline block and 86% on the drier block. Because of the complications associated with the *Eucalypt's* struggling to survive from the saline conditions alone, the results from the *Melaleuca's* are more reliable to examine.

The *Melaleuca's* were more tolerant of all the herbicide treatments when compared to the eucalypts. (see the table 4).

Table 4. Survival of all species across the 7 treatments and both blocks.

Treatment	Average survival across all *Melaleuca* species	Average survival across all *Eucalypt* species
Control	86	76
Glyphosate	95	57
Stomp®	84	75
Eclipse® + Verdict® + Select®	97	81
Logran® + Verdict® + Select®	90	77
Brodal® + simazine	64	21
Brodal®	87	69

On weed control:

The brodal/ simazine mix controlled both broadleaf weeds and grasses in the trial and will have a residual effect in controlling summer weeds and in possibly controlling weeds the following growing season, depending on rainfall.

The glyphosate, Brodal® and Brodal®/simazine mix treatments were very effective on ice plant and salt spurry, which are 2 weed species that are common around sandplain seeps. The efficacy of the herbicides may have been affected by the dry conditions in 2002; therefore further work is needed to verify the results in an "average" year.

Summary:

As expected Melaleuca's had a greater survival on the site across all treatments when compared to the Eucalypts, as they are better adapted to saline conditions. The Brodal® / simazine mix was the most damaging across all species but provided the best weed suppression. The Eclipse® /grass selective mix was the least damaging across all species however, the Melaleuca's as a group, were more tolerant of all the herbicide treatments when compared with the Eucalypts.

Caution! This trial was designed to test the tolerance of various tree species to herbicides used in agriculture. As the herbicides have no registration for use in these trees, this trial cannot endorse these products for that use.

Acknowledgements:

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