SANDALWOOD PLANTING TECHNIQUES IN THE GREENOUGH REGION

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GERALDTON

Sandalwood was the first export of much of the wheatbelt and was instrumental in opening up the land. No sandalwood has been harvested in any quantity for many years although there is one licensed puller in Moora (licensed to take dead wood only). There are some farmers who have dead remnants in the Geraldton area and I suspect that these will be gathered in the near future.

There are a few remnant living trees scattered throughout but little or no regeneration due to grazing - sheep eat the nuts from the ground. Sandalwood does provide the ideal plant to use as a conservation tool. Remnants must be fenced off after seeding. This allows other species to regenerate. But there is a high valued product that can be extracted at some future time.

My experiences are as follows:

Northampton: 1 ha of gravel over clay was planted to *A acuminata* in 1987 at 300 stems per ha approximately (seedlings ex Hamel) (16 rows of *A acuminata*). In 1988, 8 rows were sown with the following treatments - pregerminated seed, cracked seed at 2 seeds per host, cracked seed at 4 seeds per host. (N.B. only 8 rows planted as I did not have enough fresh seed). From this, I concluded the following:

1. Pregerminated seed is unreliable, fiddly, subject to damage (physical) and mould. It is not a system that can be recommended to the everyday farmer.

2. A higher percentage of hosts had at least one sandalwood with the higher planting rate.

3. Shade does not appear to be a critical aspect as the *A acuminata* had not developed any shading effect.

4. Weeds do not seem to be a problem. This is a very weedy site with pattersons curse, wild oats, capeweed, rye grass and blue lupins. In fact they may help in establishment.

5. There was some mortality over the first summer but all survivors at the end of the summer are still alive and growing well.

Actual Results

	Oct 88	April 89
No of sites planted	178	178
Sites with germination	127	91
%	71	51

In 1989, the other 8 rows were planted plus any gaps in the 1988 planting. The technique for 1989 was to use 4 cracked seeds at each host.

	May 89	April 90
No of sites planted	207	207
Sites with germination	169	127
%	82	61

A summary of all sites, following the two years of seeding is as follows.

Total sites planted 298

Total sites with sandalwood established 215

% 72

It must be remembered that within this planting which includes 9 provenances, some provenances have shown very poor germination. This may be due to old seed eg. the Pilbara provenance was collected in 1984 (31%) or seed collected from single isolated trees (35%) or seed from very high PH soils (30%). When seed is collected from roughly similar soil types, the resultant survival over two years is consistently 90%.

In 1989 the following results were obtained in other areas:

Morawa 80% site germination 60% survival after 1 year

Northampton (cracked seed) 34% site germination 14% survival after 1 year

Northampton (uncracked seed) 58% site germination 22% survival after 1 year

Note, the Northampton site for this trial is remnant bush on a steep slope. 1989 was below average rainfall. This I believe affected germination. When checked in June 1990, several sites of uncracked seed were germinating. This indicates that the uncracked seed has the ability to survive if rainfall is not sufficient to initiate germination in the first year.

In 1990 further sites were planted all with uncracked seed. One site at Carnamah is showing a 100% germination (fresh seed, uncracked, in decomposed granitic sandy loam). One site at Moora is showing a 66% germination. In this case the seed was not collected until the autumn, therefore the summer heat may have affected germination.

Current trials at Shark Bay also indicate that there is not point in cracking seed provided that seed is collected as soon as it is mature and dropped. The Shark Bay planting also has not taken account of the relationship with shade as, in that area there are plenty of indications of seedling survival in a fully exposed area. A more important consideration is host availability.

In summary, my recommendations are:

1. Use fresh seed that has been stored in a cool place. The seed should be collected as soon at it drops usually in November. Remove husks.

2. There is no need to treat the seed prior to planting.

3. Plant seed near the drip line of a potential host. Consideration may be given to the direction from which the normal rains come. This may be the wetter side of the host.

4. Plant early. I recommend mid to late April.

5. Disturb soil to a depth of 15cm then place 4 seeds to a depth of 2.5cm and firm in with foot. Leave a small indentation where rain water will lodge.

6. There is no need to worry about weed competition. Weeds may provide cover plus early host potential.

7. To plant large areas, I feel that seed could be planted with a tree planter provided it can move through the remnants. When using a tree planter, I would rip to 15cm and then drop the seed into the rip lines so as to be buried about 2.5cm. Then press wheels would be important to firm in but the scalping system on the planters would not be used.

8. The trial planting at Shark Bay (sandy surface soils) was planted using a hand held tree planter. This was pushed into the sand, tongue opened, seed dropped, planter removed, then stood on site. It saves a lot of bending. So if you have soft soils that you can push such a planter into in April, this is quite satisfactory.

9. The number of seeds placed in each site is dependent on the amount of fresh seed on hand. I like to use 4 seeds if available. At Shark Bay we used three but 5 seeds may give a consistent 100% site establishment.

10. Expect mortality over the first summer. This may be due to lack of attachment to host or lack of moisture or both. there may be 4 germinants at the start of summer but only one survivor by the start of winter.

11. There may be some benefit in soaking the seed in water for 24-48hrs before planting to initiate germination.

There is no real mystery in reestablishing sandalwood in the wheatbelt, provided these basic steps are followed.

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