SANDALWOOD (*Santalum spicatum*) and QUANDONG (*Santalum acuminatum*)

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Description:

Sandalwood is a small tree 4-6m tall with irregular branching and a sparsely leafed crown. The wood has aromatic oils and is harvested commercially in the pastoral areas for export to Asia.

Quandong is usually a more symmetrical tree to 8m. Mature trees have a rounded canopy of dense foliage and are greener in colour. The fruit of the quandong is an old bushman's and Aboriginal fruit with a very astringent flavour. Attempts are being made to commercialise the fruit as dried flesh and sells for $50 - $60/kg for top quality and $20 - $40 for other grades.

These two plants are parasitic in nature (i.e. they need other plants to attach to via the roots). From these host plants, the parasites obtain nutrients and probably some of their moisture supply.

The techniques for regeneration are the same for both species and from this point onwards, any reference to sandalwood also can be applied to quandong.

Seed Collection:

In the Mullewa area, sandalwood and quandong usually flowers late autumn, early winter. The fruit takes about six months to mature and will be ripe during late October, or early November. The seed should be collected when it is ready to drop from the tree or has recently dropped. If the seed is still on the tree, give the tree a shake, whatever falls off will be ripe.

The outside husk should be dry. This is removed before storing the seed in a cool dry spot. If the seed is to be stored more than twelve months it should be stored in a cool room at 2-5°C. I would recommend that the seed be used the first season after picking, to take benefit from maximum viability.

Site selection:

As sandalwood is a parasite, it requires an already vegetated area. Experience is showing that younger hosts are preferred. In some cases, rehabilitation and regeneration should be carried out several years before planting sandalwood so that the young hosts are well established.

Remnant Vegetation should have a mix of species such as jam (*Acacia acuminata*), kurara (*A. tetragonophylla*) and standback (*Hakea recurva*). Sandalwood will host on a wide range of species including eucalyptus, saltbush and melaleucas.

Sandalwood can be grown as a plantation by planting hosts on suitable soils. When these hosts are well established (1 to 2 years) sandalwood seed can be direct seeded. Aim at somewhere between 100 and 200 stems per hectare of hosts (= 100-200 sandalwood per hectare). Soils should be red, gritty loams to light clays. Decomposed granites are also ideal. Areas suitable for planting within the farm would include remnant vegetation on slopes and the outer margins of drainage lines. If grown as a plantation crop, select deeper soils.

Hosts could be planted in ripped lines on the contour to promote root growth into the area where sandalwood will be sown. Remember sites have to be fenced off as sheep and sandalwood are not compatible for 5 - 10 years after sowing. Rabbits will eat young sandalwood and host trees.

Sowing sandalwood seed:

Seeds should be planted without further treatment. Cracking the seed may promote quicker germination in some years but hay also promote mould within the kernel, whereas uncracked seed will remain intact and viable in the ground for several years.

It is believed that sowing seed is a better option than planting seedlings. Local seed should be used where possible.

Place the seed into some loosened soil about 25-40 mm deep. It is probably beneficial to loosen up about 150 mm of soil. This will enable the radicle to push down easily in the early stages. Firm the seed in by standing on the soil leaving an imprint in which water can collect.

Placement of the seed in relationship to the host is not critical. Decide which is the more moist side. Some protection from direct sun in the middle of summer may be beneficial. The drip line of a shrub would be suitable.

Weeds do not appear to be a problem for the sandalwood as they probably temporarily parasitize them, but in the regeneration phase it may be worthwhile spraying out weeds such as wild oats and blue lupins, to reduce the long term fire hazard.

The best time for planting is April/May, after the first rains and before the soil gets too cool. Put 3-4 seeds in at each planting site to ensure the majority of sites have seedlings in the first year. Young germinated seedlings should be visible in late September.

Management:

1. Keep stock out for at least 5 years or until the sandalwood is about 2 m high.
2. Eradicate rabbits in the area.
3. Sandalwood is fire sensitive. Put in fire breaks to protect the patch.
4. Discreet pruning may be desirable to develop a longer bole of trunk wood.
5. The effects of fertiliser application is unknown, but it would possibly speed up growth but may affect oil content. Phosphate may help the host, which could in turn, assist the sandalwood.
6. Monitor the health of the hosts. There may be times when hosts need to be replanted, especially after dry winters.

Returns:

Plantation sandalwood has not been grown before in Western Australia. If you assume that you can grow 100 stems per ha and 100 stems will give 3 tonne of wood, the returns are potentially high. Sandalwood is worth about $3000 per tonne from private property. Well managed sites on good soils may grow 200 stems per ha. Note that these are ball-park figures!

The beauty of timber crops is that you decide when to harvest and at what rate. It may be the best superannuation policy of the lot. In Europe, investments are made into oaks which take 200 years to mature.

Healthy young sandalwoods have been known to be 1.5 m tall after 4 years and begin producing nuts. Sandalwood for timber may take up to 50 years to reach marketable size but future research may reduce this time.

Information:

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