

Sandalwood

Santalum spicatum

Plantation Layout and Host Establishment

The spacing of rows and orientation of a plantation should be designed to accommodate the future needs of the grower. Generally it should be designed to allow harvest of seed at 5 years and wood from 15 years. There will be variations in plantation layout and site preparation depending on the soil type and fertility, rainfall, weed burden, site characteristics and future use. Sites in the wheatbelt have been established using tubestock, direct seeding or a combination of both. For direct seeding you will need the use of a specialised machine or modified tree planter, good weed control and possibly the use of a pesticide to control redlegged earth mite.

There are many other examples of plantation configuration and mixtures of species being trialled by sandalwood growers. Seek out local growers and ask their advice. Generally they will be eager to help. Members of the ASN have free access to our peer mentoring service.

Access and Fire

Considerations about layout should include access for weed control and harvesting and to achieve the required density of trees per ha. Include placement of fire breaks of 6m around the perimeter of the plantation. In larger plantations they may need to be wider. Include turning areas for fire trucks and harvesting equipment. Consult your local government authority for guidelines on any planning approval needed for plantations. Fence the plantation to exclude stock if appropriate.

Site Preparation

Once the plantation layout is decided and marked out, typically the site should be ripped down to a depth of approx 0.4m. Rip lines should be made across the slope where possible to prevent surface erosion and take advantage of water harvesting.

The most common configurations for layout of plantations which are being used at present are:

- * In low rainfall areas 250 - 350mm with lighter soils, paired rows 2.5m apart with a 10m gap between using multiple host species at a minimum rate of 1,000 per hectare. In higher rainfall areas over 350mm on sites with a moisture retaining soil, a reduction in the gap space and a corresponding increase in density can be considered.
- * Single rows of 4 - 5m spacing, effectively a block planting, for sites in over 350mm rainfall areas on moisture retaining soil with a corresponding increase in spacing for low rainfall areas on lighter soil. Commonly, single host species (*Acacia acuminata*) are used in this configuration but some plantations may have two or three other species included to increase biodiversity depending on site details.

If a hard pan is identified at a greater depth then ripping operations should be aimed at cracking this pan to facilitate root penetration. Typically this operation is done at the beginning or end of summer. The rows can also be mounded in wet areas or scalped where the weed burden is high. Scalping is commonly used when direct seeding to remove weed burden. This method has been used successfully in the NE Wheatbelt in WA. Please see "Plantation Spacing for required tree density" (available from the ASN) for possible options to achieve the desired density and spacing of hosts and sandalwood trees.



Grazing

Plantations consisting of hosts with a tree form such as *Acacia acuminata* (typical variant) may be grazed by sheep five years after establishment of the sandalwood. Plantations containing low growing species and ground covers may not be suitable for grazing. Biodiverse plantations containing *Gastrolobium* species must not be used for grazing as this species contains 1080 poison, and can result in the death of stock.

Rabbits

If there are rabbit populations near to your site they will increase once the plantation is established and will severely affect host establishment. You should make every effort to reduce the rabbit population in the summer before host establishment. You can use pindone based products available from your local farm or hardware shop or apply to the Department of Food and Agriculture (DFA) for 1080 based baits. Successful rabbit control is best done in summer when green feed is limited. If warrens can be located these can be ripped. For further information refer to the DFA publication Farm Notes No. 58/99 or contact your local DFA for 1080 bait applications.

Pre-establishment Weed Control

The amount of weed burden and soil type needs to be considered when deciding on the level of weed control. More fertile soils may need some weed control in the previous season before establishment as they are likely to have a heavier weed burden. In lighter sandier soils some weed retention may be appropriate especially in exposed sites to reduce wind erosion, evaporation etc.

In early winter of the host establishment year, spray the rows with knock down and residual herbicide applications to control weeds. As part of your site evaluation you should identify and assess the weed species and density on your site and discuss control with your chemical supplier. Previous weed control history should be taken into consideration when planning to avoid herbicide resistance.

Host establishment

Further weed control using a knock down may be necessary before planting depending on the weed burden. Be careful with the use of residual herbicide at this stage which may burn newly planted seedlings. Ideally the soil should be moist before planting.

For establishment using tubestock

Two weeks after spraying, plant six-month-old host seedlings along the rows at 1.6 - 2m intervals (1000 - 1250 stems/ha). Any of the host species can be planted, but it is recommended that the host seedling mix should contain at least 50% *Acacia acuminata* (typical variant and/or narrow phyllode variant) depending on the location and soil type.

For establishment by direct seeding

Control weeds in the season prior to sowing using a residual and knock-down herbicide. Two weeks before sowing spray another application of knock down herbicide to reduce competition for the germinating seedlings. The application of a pesticide to control redlegged earth mite should be included in the final spray before sowing and again after seed germination if the pest is identified as present. A modified tree planter with a scalper is often used for direct seeding operations. Scalping of the soil to reduce the weed competition is essential.



Single row multihost configuration.

References and further information

Brand, John 2006 WA Sandalwood (*Santalum spicatum*) establishment guide for farmland in the Wheatbelt, Cultural experiences of Members of the Australian Sandalwood Network gathered over the last five years and shared through newsletters, workshops and meetings. www.sandalwood.org.au

This fact sheet has been produced with funding provided by Lotterywest.

