Agroforestry with Australian Species

The opportunities and benefits of farming Oil Mallee and Australian Sandalwood in the SA Murray Mallee

Woody perennial species can provide Mallee farmers with an excellent opportunity to diversify income streams, improve productivity and increase biodiversity.

Sustainability and flexibility
Woody perennial species such as Oil Mallee and Australian Sandalwood can diversify income-generating farming options for landholders. Benefits include sustainable on-farm diversification, especially during dry climatic conditions, as well as addressing Natural Resource Management (NRM) issues such as soil erosion, regional groundwater recharge and lack of natural habitats.

While Mallee plantations have some obvious environmental advantages, they also have the potential to deliver a wide range of other benefits. Oil Mallee species can be used to build effective carbon sinks whilst providing a harvestable product with potential for a wide range of uses such as renewable fuel sources, bio-char, and eucalyptus oil.

Australian Sandalwood is a parasitic plant and has the potential to provide a healthy farm income. Not only is there a long and established market for its timber but it also produces an edible nut. Oil can also be extracted from the timber for use in the cosmetic industry.

The value of Sandalwood timber becomes significant once it forms in the hearthwood and it can take considerable time. Growers should consider plantations as a long-term or “superannuation” investment.

Both Oil Mallee and Australian Sandalwood are suitable for planting in the South Australian Mallee area as they are well adapted to low rainfall. Local native plant species are incorporated into Sandalwood plantations as hosts which further increases biodiversity and can provide fodder for stock.

Integrating traditional farming
With careful site selection and layout, both types of plantations can be integrated into traditional farming practices such as cropping and grazing. Combining plantations with traditional farming practices will ensure that income streams are maintained in the short term as tree crops are maturing.

Traditional farming practices can also be an important management tool. Strategic grazing and cropping within inter rows will help reduce weed competition as well as halt the spread of tree species outside plantations which which would otherwise hinder the accessibility of harvest machinery. The inclusion of fodder shrubs in Sandalwood plantations will also improve grazing regimes.

Combining plantations with traditional farming practices will ensure that income streams are maintained in the short term.
Detailed planning, site selection and preparation are essential to a successful plantation. Key considerations should include local conditions, existing and adjacent land use, plantation objective and social and cultural heritage.

Site selection

Suitability

Australian Sandalwood and several species of Oil Mallee are well suited to low rainfall climates. Sandalwood occurs naturally throughout the Western Australian wheat belt and into South Australia. Both Sandalwood and many Oil Mallee species can tolerate an annual rainfall range of 250mm – 600mm. Temperature and wind frequency need to be considered as the rate of evaporation may decrease moisture content in the soil. Surface moisture availability will become less important as the trees grow and their ability to access groundwater increases. It is essential that local climatic conditions are taken into account so that the most suitable Oil Mallee or Sandalwood host species are selected.

Soils

The most suitable soil for Sandalwood in the WA Murray Mallee is sandy loam river clay. It will tolerate calcareous loam, however both surface and sub-surface water retention is vital. Again, host species should be chosen to suit the specific soil type of the site.

The preferred soil type for Oil Mallee ranges from sandy clays to clay loams and heavy clays. Species selection will depend on soil type. Deeper soils are preferred for good groundwater availability especially in commercial-scale plantings.

Site preparation

Rows for planting can be rippled, mounded or scalped depending on the site. Adequate pest animal and weed control is also essential to maximise seedling survival rate and the long-term viability of the plantation. In areas where grazing occurs, controlled access of stock is also an important factor to consider. Stock should be excluded until plants are well-established.
Oil Mallee

Species selection

Oil Mallee species should be chosen with consideration of local climatic conditions, soil type and salinity. In addition, species should be chosen to best suit the objectives of the plantation. Determining characteristics may include oil content, growth rate, biomass potential and life span.

Seedlings

Oil Mallee seedlings should be sourced from an accredited supplier. It is best to obtain seedlings as close to the planting date as possible and store them in a protected location where they can be kept moist.

Laying

Depending on the purpose of the plantation layout may be either a belt (nurse plants separated by alleys), or block (more than eight rows of trees, or less than 40 metres between belts).

Belt plantations are best suited to integration with traditional farming practices as they allow for machinery access and space for cropping or grazing of stock. Space between belts also reduces water harvest competition and allows for greater underground biomass to develop.

If the intention is to harvest the trees, consideration needs to be given to the accessibility and efficiency of mechanical harvesters. In this instance, it is best to plant trees in long rows three metres apart.

This map shows agricultural areas with the most suitable soil types that could support Oil Mallee or Sandalwood plantations on a regional scale. On-farm site selection would need to consider localised conditions to ensure that the most suitable Oil Mallee and/or Sandalwood host species are selected.

Australianna Sandalwood

Host species selection

The main host species of Australian Sandalwood are Acacia. Ideally, local provenance species should be used as these will be more suited to climatic conditions and soil type. It is also important to use a mixture of long-lived and short-lived species. Other local native species of Gymea, Nickle and Allyconium are suitable minor hosts and can be included to improve habitat value. Potential folder species including Ateplax are also a worthwhile addition.

Species establishment

Host species are established in the first year. This is best done through a mixture of direct seeding and tube stock. The rate at which seeds are sown will depend on site conditions. Seek advice to determine what will work best for your site.

If host species are to be direct-seeded then seeds will need to be treated. Methods will vary depending on the species. However, in general Acacia seed will need to be submerged in very hot water to crack the outside casing. Advice should be sought to determine the best way to treat your chosen species.

Prior to sowing, Sandalwood nuts need to be cracked to aid germination. This can be accomplished by mixing them for 4-12 hours then laying them out in warm, dry weather—summer is usually the best time to do this.

Layout

Sandalwood hosts are best planted at intervals of two metres or less. Plant two to three Sandalwood seeds every five metres along planting lines approximately half a metre away from the host at a depth of two to three centimetres.
WANT TO LEARN MORE?

The Murray Mallee local Action Planning Association can provide land managers with further technical advice on the establishment and management of Oil Mallee and Australian Sandalwood plantations.

Land managers are also encouraged to consult online resources such as the Oil Mallee Association of Australia: www.oilmallee.org.au and the Australian Sandalwood Network: www.sandalwood.org.au. Both organisations provide detailed information relating to farming these tree species and sourcing seed and seedlings. Further assistance can also be provided by the Forest Products Commission in Western Australia: www.fpc.wa.gov.au.

Demonstration sites

In 2011, three Oil Mallee and four Australian Sandalwood best practice demonstration sites were established on farms in the SA Murray Mallee. These sites were spread throughout the region to illustrate how plantations perform under varying conditions. The long-term goal is to demonstrate the potential for Australian woody perennial species to improve production gains whilst addressing NRM issues.

Sandalwood sites include a mixture of native species, including some leguminous fodder shrubs. After the harvest of the Sandalwood, the majority of these shrubs will remain. This will not only demonstrate their value as a forage species but also create vegetation corridors and help reduce the risk of soil erosion by stabilising sandy soils and creating wind breaks.

The properties are located at Bugle Hut, Bomia, Halidon and Kalyana. Anyone wishing to view the demonstration sites should contact the Murray Mallee Local Action Planning Association and we'll help arrange a site visit.

Further Information

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