

# A decade of oil mallees gets results

The Quicke family from Kulin, Western Australia, started planting oil mallees during 1995 in a bid to curtail salinity and protect stock. Today, with more than 175,000 established mallees, Norm and Trudi are reaping the rewards not only of reduced salinity but a successful integrated tree cropping program. The hardy native trees have demonstrated a survival rate better than 85 per cent. Norm has had the most success in terms of survival and grazing preference, with oil mallee species *E. loxophleba lissophloia* and *E. polybractea*.

"We sourced local mallee species from the Kulin Tree Nursery and started planting along fence lines," Norm explained.

"We have continued planting mallees – coupled with saltbush – on our lower country, since 2002.

We make our planting decisions with help of David McFall from the Upper Great Southern Oil Mallee Association. For the past three years the Avon Catchment Council's Integrated Water Management – salinity/ integrated tree cropping program has also given their support.

This project provides seedlings and other support services and we contribute to the establishment costs and receive additional benefits based on the survival and performance of the trees.

Survival rates have been excellent and as a result the reward incentives have largely covered the establishment costs. We would have continued planting oil mallees regardless but the extra support has allowed us to carry out larger scale plantings.

## key points

- Oil mallees have proven to be a handy weapon in the fight against salinity
- Strategic plantings can be combined with an integrated cropping and grazing program
- The development of a carbon trading scheme is set to offer more opportunities for farmers who have invested in oil mallees.

## farm info.

**Case study:** Norm and Trudi Quicke

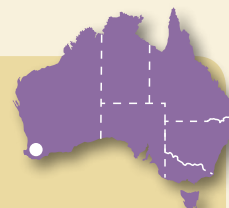
**Location:** Kulin, Western Australia

**Property size:** 1740 ha

**Mean annual rainfall:** 300 mm

**Soils:** Mostly clay with some loam

**Enterprises:** Sheep and cropping



Photos: Monica Durcan

Norm and Trudi, with daughter Macushla, have integrated oil mallees into their farming system and continue to plant up to 30,000 new seedlings each year. INSET: Norm and family have high hopes that carbon trading will provide further incentives for oil mallee plantings.

### The benefits of mallees

The paddock we first planted to mallees had no trees and was becoming saline. We decided mallee would be best for both soil protection and salinity control.

If we had not put in the trees we would have lost more land to salt than the land we lost to the trees.

During the first six years the trees reduced the scalds – they decreased until there was only one left in the paddock.

But after the 2006 flood the scald problem started to return. The site was under water three times over 15 years, which killed a few trees and, as a result, some salty patches still remain in the 'crab hole' country.

### Bringing it all together

We have integrated the mallees into our farming system. During 1998 we bought a 400 ha farm that had 13 square paddocks running across the creek line. We dismantled the fences and realigned and redesigned the land into four paddocks. We now farm these to suit the landscape, which has meant planting 10% of the area to mallees. We have also fenced and revegetated the creek line.

During autumn 2008, we planted 52,000 oil mallees over three days. We would continue to plant that many trees but it is a lot to handle.

We now plant 20,000-30,000 seedlings per year using two tree planters, a single and



a double row planter. This results in three rows, which seem to work well.

### Mallee establishment

I crop twice before planting to reduce the weed burden and help the trees establish. I then run young sheep – less than 18 months old – and wethers in the trees when they are about one metre high and after a second crop.

Mostly it is unnecessary to overspray as the sheep clean up any weeds, as long as a knockdown is applied and a successful weed kill results before the trees go in. This year I did have to overspray quite a few trees because rain resulted in weed resurgence.

We now use a GPS to line up the rows – a much simpler option than the drums we used to use.

The location of the rows is marked with a ripper and in most years I rip again to a depth of 400 mm or deeper if possible – but it was not necessary during 2008.

Nowadays, I enlist the help of a local contractor to help with planting. The machines plant deeper and the trees seem to do better than when we hand plant.

### Planting design

We have eight paddocks which operate under various configurations of belt layouts, some

trials and plantings along contours and creek lines (four rows below contours and four rows either side of the creek lines).

We have found that triple rows fit best with our system giving us a 10 m canopy width over 6 m of trees allowing six runs with the seeding machinery in between. We use a 21 m boomspray and 10.7 m seeder bar and machinery width played a role in determining the distance between our mallee belts.

I have set up the rows across the hill as much on the contour as possible so water will run into the crop and trees.

### Lessons learnt

I believe there are three secrets to the successful oil mallee establishment: pre-ripping, weed control before planting and grazing younger stock during the first year.

**Ripping** – in most years I pre-rip to shatter the soil further out and then drive over the rips to break-up any clumps. I may go over the site again if the rips have not gone deep enough. Ripping when the soil is drier gives the best results – you can actually see the soil lift.

**Weeds** – trees will not grow when there is a weed burden during the first year so first season weed control is essential.

**Grazing** – the best results are with weaners but definitely graze sheep less than 18-months of age.

**Access** – I leave an access gap for machinery and to see the paddock easily. I've put in machinery access from corner to corner and paddock to paddock.

### Plans for the future

We plan to plant another two paddocks of mallees during 2009, which effectively gives us about 45 ha under the trees. But as to how many more we will plant after that, it will depend on the carbon credit situation.

I believe we will be way in front when it the time comes that every farmer is responsible for their own greenhouse gas emissions. If the Government or industry provide incentives to increase plantings to 15% of the farm we might well do the work having learnt from how effective integrated tree cropping can be.”

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By John Bartle, RSU

science behind the story

- There are several mallee species that have been selected for development in Western Australia. Mallees are eucalypts that have a characteristic multi-stemmed form and a lignotuber (the 'mallee root') just below the ground surface. The lignotuber carries numerous embryonic shoots that rapidly sprout or coppice if the tops are lost to fire or harvested as a crop. The mallee species now in widespread use were selected to suit the range of soil types and land conditions on wheatbelt farms. They include ones tolerant of salinity, acidity and waterlogging. All selected species are high in leaf oil, which is a potential product, as well as conferring a high degree of grazing tolerance. Mallee belts do not need to be fenced.

The attraction of growing mallee in belts is that they are high water users. In deep soils (without shallow groundwater) mallees quickly develop extensive deep (greater than 10 metres) and lateral (up to 20 m)

root systems. A couple of deep drilling investigations have shown that this enables mallee belts to form a wide, deep zone of dried-out soil. With good design of belt layouts, this dry zone can be used as a 'sink' or reservoir to intercept and store surface and shallow sub-surface water flows. Especially from lower slopes, surface run-off is a major source of waterlogging, recharge of groundwater and salinity on valley floors. If this water is captured by the mallee belt then water that would otherwise be a problem can be converted into mallee growth.

The development of mallee industries has been slower than hoped. Even with 15 years of research and development, farmer planting and experience, and assuming an efficient harvester is available, mallees probably still fall short of being commercially competitive with the annual crops and pastures of the wheatbelt. But, recent economic analysis undertaken by the FFI CRC shows that with the likely value of sequestered carbon under the new National Carbon Pollution Reduction Scheme

(\$20 per tonne carbon dioxide), mallee crops could become competitive with annual crops. Note that in this analysis, the effect of mallee belts in suppressing adjacent crops was fully accounted for.

The extensive planting of mallee undertaken by farmers like Norm Quicke and many others has generated invaluable experience and confidence in potential commercial mallee production. The resource they have built also provides confidence and potential early supply of mallee biomass to processing entrepreneurs.

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