

## Farmer experiences in farm forestry

David and Linda Campbell, Karingal and Fairy Downs, Scaddan, Esperance

By Neil Coy, Esperance

*On purchasing 'Fairy Downs' in 1991, as an adjunct to their established cereal cropping and sheep grazing 'Karingal' property, David and Linda Campbell took on the challenge of establishing trees on a love grass-covered\* 70 ha sand dune at Fairy Downs. After good results with blue gums in such a low rainfall area, they meticulously planned an innovative approach to tree planting incorporating cereal cropping on a sand hill.*

\* African love grass (*Eragrostis curvula*)

*Although the Campbells initially wanted an agroforestry regime that would satisfy Landcare requirements, they eventually became interested in using trees for wood as a source of diversified income. Whatever the end uses and long term outcome from their trees, the Campbells will have gained much satisfaction from creating an extensive plot of large trees on a relatively unproductive sandhill.*

*David and Linda Campbell, winners of the 1999 AFG-Stihl WA Tree Farmer of the Year Award, for their pioneering work in using tree farming as an effective part of land management. (Photographed at the Agroforestry Expo 1999, Boyup Brook.)*



### Fairy Downs

This 400 ha property is located on Speddingup Road West, some 10 km south-west of Karingal. With close proximity to the south coast, rainfall averages 450 mm, some 50 mm more than at the Karingal property.

At the entrance to Fairy Downs is a 70 ha sand dune (up to 6 m of yellow sand over clay) which forms a divide

between the upper Dalyup West catchment to the east and Coombalbidgup Creek to the west.

After planting a cereal rye crop on this dune in 1992, the Campbells decided to plant trees on it even though others had stated that this love grass-invaded dune, known as 'F9' hill, could not grow a crop, let alone trees.

### Blue gums

David and Linda were encouraged to plant blue gums on F9 Hill after early successes with an experimental planting of 5000 blue gums (*Eucalyptus globulus*) on the sandier parts of the farm at Fairy Downs (planted in 1993). Apart from early difficulties with a spraying mishap, drought and recent waterlogging (due to poor site selection) the remaining blue gums are growing better than expected given rainfall in this location. In year 2000 their average heights were 9 to 12 m with an average DBHOB of 20 cm. The largest trees were 15 m high with a DBHOB of 40 cm.



*David and Linda Campbell with their 7-year-old stand of Tasmanian blue gums on 'Fairy Downs' property. Stand density is 250 stems per hectare and these trees are now pruned for sawlogs. In 2000, they have an average diameter at breast height over bark (DBHOB) of 20 cm and average heights of 9 to 12 m. Ephemeral wetland in the background is evidence of two record wet summers in the Esperance region.*

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View across cereal paddock (July 2000) to 4-year-old mixed eucalypts and acacias (background) on the 70 ha agroforestry planting on F9 hill at Fairy Downs.

### F9 Hill (Fairy Downs)

The planting process for this 70 ha sand dune was planned very carefully by the Campbells after consultation with Bev and Marden Hundley of 'Green Scene' Nursery on Myrup Road. With their primary aim of creating workable windbreaks and controlling salinity in the valley, six eucalypt species were chosen with possible agroforestry options in mind.

First they surveyed around the hill, avoiding power lines, to create three 35 m wide belts of trees along the contours with a 61 m wide alley between each belt of trees and a small triangular section at the summit. This time consuming layout was done without the use of a Global Positioning System (GPS). David said it would be a very useful aid should this be attempted again. Each tree belt was eight rows wide, providing 1000 stems/ha with spacings of 5 m x 2 m. These alleys were used for planting grain crops in the sheltered conditions provided by the trees.

The alley widths were designed to accommodate the width of spraying and harvesting machinery.

To minimise potentially damaging wind funnelling at the ends of the tree belts, openings at the end of each belt were made just wide enough for movement of machinery through to the adjacent alley.

### Planting

After degraded, remnant vegetation was cleared and rabbits poisoned, the soil was ripped and firmed back over the rip line by running over it with a tractor wheel, and knockdown herbicide was applied with a wetting agent. In 1996 a planting team planted 19,000 eucalypts and acacias in eight rows along each belt (30 ha of trees).

Six rows of eucalypts were planted between fast growing golden wreath (*Acacia saligna*) and black wattle (*A. mearnsii*) which were planted on the outside rows to serve as wind breaks. The eucalypts included southern mahogany (*E. botryoides*), sugar gum (*E. cladocalyx*), blue gum (*E. globulus*), tuart (*E. gomphocephala*), yellow gum (*E. leucoxyton*) and manna gum (*E. viminalis*). All these species are adapted to local south coast conditions. The acacias and sugar gums have fared best to date.



View looking down a 61 m wide alley created by the tree belts on F9 sand hill. There is now a much diminished threat of soil erosion in the alleys as a result of shelter provided by the trees.

Lucerne was direct seeded between the rows to compete against the love grass, give wind protection to the young seedlings, supply nitrogen to the trees as they grew, and to provide fodder to grazing animals. While there was a potential to cut lucerne hay between the rows, the Campbells subsequently destocked the property.

### Wind disaster

Almost immediately after planting was completed (1996) a prolonged, three-week wind event blew many seedlings out of the ground in rows orientated north-west/south-east. The bare areas were covered with cereal rye straw a few weeks later and were planted successfully although it was very labour intensive. Missing plants were infilled by planting mostly bare-rooted maritime pine (*Pinus pinaster*). This was followed up over the next two years by further infilling with blue gum, yellow gum and maritime pine.

As a result of this wind disaster the Campbells now minimise the risk of failure with future plantings by machine-planting into an established annual crop such as lupins. They have found that the weed control from residual simazine applied when the lupins were sown is beneficial when planting seedlings directly into the young crop. The Campbells, helped by their children who walk behind the planter to remedy planting mistakes, have now achieved a 95 per cent success rate.

### Other problems

There remains the ongoing problem of love grass control between the rows of trees. For some time the acacias (outside windbreak rows) retarded growth of the eucalypts (although the latter are beginning to outgrow the acacias in some situations). There have also been minor problems with grubs and mites. Dealing with these problems is subject to the time/labour constraints associated with the many duties of running a farm.

### Progress

Trees at Fairy Downs have grown at a most impressive rate for the locality and have prevented erosion in the alleys between the trees.

The acacias and eucalypts are now about 4 to 5 m tall. Linda Campbell said they should not have planted acacias in some of the middle rows as they competed too strongly with the eucalypts, but at planting time there were not enough eucalypts to fill all the spaces. They now realise the centre row acacias will need to be removed.

### Ongoing management

The most important concept realised by the Campbells is that the grower needs to be clear on what is wanted from the planting: That is, whether the trees will be for windbreaks, grazing, agroforestry, water utilisation, salinity control or some combination of all of these factors.

With agroforestry as their preferred option the Campbells have developed silvicultural skills such as pruning and thinning the trees for the most effective combination of windbreak, water utilisation and grazing potential.



▲ David pruning the mixed eucalypts within the 8-row tree belts on F9 sand hill. Trees are pruned to 6 m to enable them to be harvested in the future for sawlogs.

◀ An end view of one of the 8-row tree belts on F9 sand hill showing the bulk of foliage provided by the acacias (left) as a wind break barrier for trees in inner rows.



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The Campbells began form pruning their trees to produce knot-free sawlogs, after two years, with further pruning and thinning as time allows. They caution other 'would be' growers that this is a daunting task in a large plantation.

David and Linda said that one of the hardest realisations in growing trees for agroforestry was knowing that they may eventually be cut down. They also said appropriate management could be difficult if time, labour and money were limiting factors, with an uncertain financial return being so far away.



*Linda Campbell with maritime pines she has successfully established on the eastern edge of the F9 sand hill. They were planted into a bed of cereal rye straw which although a labour intensive task, has provided valuable protection from wind-blowing in the establishment phase.*

## Future prospects at Fairy Downs

With their substantial success in establishing vigorous belts of trees on F9 Hill, David and Linda Campbell are thinking of participating in a maritime share farming project with CALM to plant 180 ha of maritime pine trees on the other three sand dunes at Fairy Downs. There is also the possibility of planting maritime pines along the vacant alleys between their impressive belts of trees that have made F9 Hill such an attractive feature of the landscape.

David and Linda say they are proud of their achievements. Although there is no guarantee the trees will continue to thrive in this medium rainfall area, in another 25 years or so, the Campbells hope to be able to harvest the trees that are presently growing so well on Fairy Downs

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