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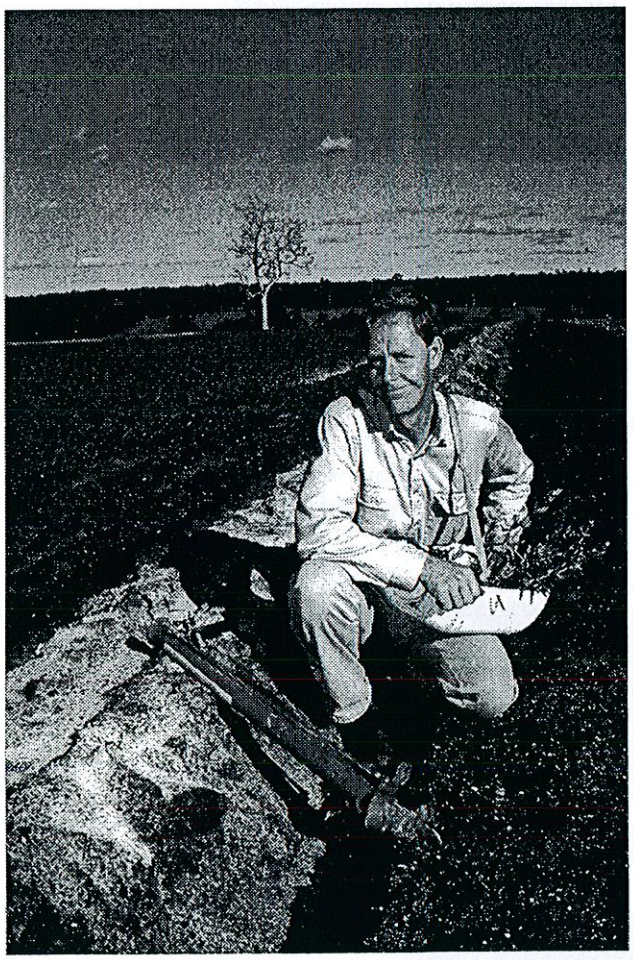
Farmer experiences in farm forestry

Peter and Jan Coffey, Jingalup, near Kojonup

When Peter and Jan Coffey first considered incorporating tree farming with their merino wool enterprise at Kojonup they had three main criteria. They wanted to be economically viable, address landcare problems such as salinity and erosion and most importantly they wanted 100 per cent equity in their trees. In addition they wanted the trees to complement their main farm enterprises – wool, grain and prime lambs.

With these objectives in mind, Peter, an agricultural science graduate, and Jan, a teacher, began researching tree plantations and agroforestry. Nine years and thousands of trees later their farming operation has changed from a 90 per cent merino wool base to embrace agroforestry and more particularly alley tree farming.



Peter Coffey establishing blue gums in the cropping phase. This provides for minimal loss of production and no fencing is required.

Peter and Jan run 6000 merinos primarily for wool. About 2000 ewes are mated to poll Dorset rams each year for the prime lamb market. This year the Coffeys expect to turn off about 2000 lambs. Grain is also an important part of their farming business: crops include oats, canola, wheat and lupins.

The Coffeys own properties in two different catchments. This requires planning for varying conditions. Their 680 ha home property at Jingalup (annual rainfall of 550 mm), is south-west of Kojonup and in the Warren-Tone catchment - a recovery catchment under the Salinity Action Plan. The Plan aims to return this catchment to a potable water resource by 2030.

Their second property, 433 ha Bloomvale, is situated 35 km south-east of Boyup Brook and is part of the Blackwood River catchment. Although they began their tree farming enterprise at Jingalup, Peter and Jan quickly realised the potential of Bloomvale with its slightly higher rainfall (575 mm annually). Soils on the property are generally good gravelly loams and the upper catchment of the farm is protected by native bush (A Class Reserve).

Starting out

Peter and Jan began commercial tree farming at Jingalup in 1991 when they planted two 5 ha plots of blue gum (*Eucalyptus globulus*). The trees were established at conventional spacings of 5 m x 2 m on moisture gaining sites. Initially the trees were planted with the woodchip market in mind but after thinning and pruning to correct extensive parrot damage in the early stages, the emphasis changed to sawlogs. Other plantings were carried out for landcare purposes.

Getting into alleys

Having developed an interest in agroforestry, Peter and Jan were spurred into action in 1994 at Bloomvale after witnessing the rapid development of saline hillside seepages. They had not acted earlier as the system they had in mind required belts running north-south, which didn't fit with conventional contour farming principles. They decided to try alley tree farming – a system where crops and pastures are grown in the alleys between rows of trees and shrubs. At that time it was relatively new in the South West although the system was being used in the wheatbelt and coastal sandplains in response to different environmental problems and commercial opportunities.

The economic principle behind alley farming is that the net value of tree products plus the net effect of trees on agricultural yield in the alley needs to be equal to or greater than the value of the crop or pasture displaced by the trees.

A landcare benefit

Armed with technical advice from Agriculture Western Australia , the Department of Conservation and Land Management (CALM) and growers David Jenkins and David and Bruce Mattinson, the Coffeys began tree planting on Bloomvale in earnest.

Initially, 40,000 blue gum trees were planted over 140 ha (about one-third of the farm) in 2-row belts separated by 40 m alleys. In the belts the trees were planted 1.5 m apart along the rows with 2 m between rows. In later plantings Peter has increased the row spacing to 3 m.

Blue gums were chosen as they required no fencing, there was an established industry based on woodpulp, and sawlogs from blue gums were showing some potential.

The belts are orientated north-south to reduce shading of crops and pastures. As a result, trees are not planted along the contours except on some of the waterlogged lower slopes. Alley spacings are reduced to 16 m in this instance (one boomspray width). Whereas the 40 m alleys accommodate three boomspray widths.

Site preparation

To prepare for planting the ground was ripped to a depth of 90 cm in autumn and mounded. The mound was then flattened to prevent water erosion as most belts run up and down the slope. The site was then sprayed with 1 L/ha glyphosphate and 8 L/ha simazine in June. The trees were planted in July/August and established in a cropping phase with stubbles being lightly grazed after harvest. Peter says no browsing has been experienced although sometimes trees are damaged by trampling. Parrot control is an essential part of the program.

Initial establishment costs were $225/ha but this year Peter expects the costs to be reduced to $185/ha largely by eliminating deep ripping costs.

Overcoming early problems

Despite all the research and preparation most of the first year's plantings at Bloomvale failed. The trees displayed symptoms consistent with an overdose of simazine, but this was dismissed as the cause as rates used were similar to normal plantation practice. Large numbers of Rutherglen bugs which bred up in the canola crop spelled the final death knell to most of the first year's plantings. One lesson learned: canola is not an appropriate nurse crop.

Undeterred, Peter and Jan replaced the trees in 1995, only to experience similar problems. They concluded that in the absence of a mound, simazine accumulates at toxic levels in the ripped zone where the tree roots proliferate.

On Peter Coffey's Bloomvale property: 2-row belts of blue gum planted in a north-south orientation maximise sunlight received by pastures or crops.

The trees were re-established in 1996 on mounds with an oat crop in the alleys. This establishment was successful, and with minimal soil erosion.

Well underway

In 1997 there were no plantings. The Coffeys took a year off to rest and reflect on the system. In 1998 a further 40 ha were planted, and a further 32 ha in 1999 - taking the total plantings so far to around 190 ha.

Peter is particularly pleased with the way the trees performed during the dry summer of 1998/99. He says the alley farming system of restricting plantings to two rows has paid dividends with trees coping well with less rainfall.

Peter puts this down to the 'edge effect' and firmly believes even one more row of trees would be detrimental to what he is trying to achieve.

Peter says the benefits of the 'edge effect' can also be seen in a 3-row belt of *Pinus radiata* planted 25 years ago on Bloomvale as a windbreak. The basal area of the trees is 100 square metres per hectare, about three times the maximum basal area usually found in plantation pines.

Thinning and pruning

Peter and Jan have decided to manage the trees so that sawlog options can be pursued in the future. This involves selecting about 10 to 20 per cent of the trees showing the best growth and good form, and pruning branches to restrict the knotty core to 16 cm or less.

Peter starts pruning at age three to a stem diameter of 10 cm. This first lift is to a height of 2.5 to 3 m. The second and third lifts will be done with a cherry picker to a height of 6.5 m. Peter says thinning for pulpwood is planned for year 10 but may be delayed if the alley trees are still growing vigorously at year 10. Thinning will be brought forward if it is felt the sawlog crop needs to be 'released' to maintain their growth rate.

Edge trees are more likely to bend away from each other as they grow, unless thinned early to a single row, or to much wider spacing. CSIRO researchers have expressed concern about growth stresses and tension wood formation in edge globulus leading to downgrading of sawlogs. Peter has adjusted his row spacing to 3 m for the sawlog market in an effort to compensate for this possibility.

Timber products

In 1999 Peter reaped rewards from thinning the 5 ha blocks of 8-year-old blue gum on Jingalup. He turned much of the timber into fence posts, strainers and struts. The trees have been thinned from 1000 stems/ha to 125 stems/ha. The heavy thinning is to ensure the remaining trees have enough room to grow straight and relatively free from competition to reduce the possibility of uneven growth stresses.

The remaining trees will be grown on for sawlogs while the thinnings have been debarked, dried and treated at Bridgetown Timber Treaters. The 1.8 m posts and 2.1 m strainers will be used to replace the boundary fence at Bloomvale. Treated timber posts currently sell for between $4 and $6. With his labour included, particularly for debarking, Peter estimates only a marginal saving on purchasing of new posts but says there is a personal satisfaction in using his own posts.

Future plans

In 1999 Peter and Jan are planting 3000 trees at Jingalup, many in single rows along drainage/contour banks. *E. globulus* (blue gum), *Corymbia maculata* (spotted gum) and *E. cladocalyx* (sugar gum) have been chosen primarily for the sawlog market.

To explore the potential of oil mallees, Peter and Jan will have planted a 500 m belt as part of a CALM trial to establish performance data in the higher rainfall areas.

Over the next three years they hope to finish planting 80 per cent of the Bloomvale property and may then extend this regime to the Jingalup farm.

Next winter Peter and Jan are keen to plant 40 ha of maritime pines (*P. pinaster*) at Jingalup in a CALM sharefarming scheme. The plan is to put in 1600 stems/ha in a dense planting. It will utilise the sandier soils where pastures and crops are less productive. Peter says under the agreement he and Jan will maintain 30 per cent equity in the trees at harvest.

Monitoring the effects on landcare

The trees have provided shade and shelter easily within two to three years. Reversing rising watertables and hence salinity, could take up to six years but Peter believes he is beginning to see a slowing in groundwater rises this year. To keep a check on progress, Peter monitors nine bores each month including two control sites under pastures.

Advice for new alley tree farmers

Peter believes research and self-education are extremely important if farmers are to meet the challenges in agroforestry/alley tree farming. The Master TreeGrower course – an 8-day course in farm forestry – is an excellent way to acquire the skills to design your own farm forestry enterprise, and networks you with others in the industry. Since he became involved with trees Peter has obtained a Certificate in Farm Forestry from the University of Melbourne and has become a qualified community landcare technician.

Marketing and economics

As their operations are self-funded, the Coffeys are responsible for finding their own markets. They also have some decisions to make about whether to focus on woodchips or high quality sawlogs - such decisions will influence management practices. They remain optimistic about the future and put their break even stumpage at only $5 per cubic metre for pulpwood at Bloomvale.

Peter expects the blue gum belts will raise net returns on Bloomvale. He calculates the 18-year blue gum alleys project has an internal rate of return (IRR) of 18 per cent.

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