

# TreeNote

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## Farmer experiences in farm forestry

David and Dianne Jenkins, Bridgetown

*David and Dianne describe their tree farming experience as a hobby that snowballed. It started as a desire to improve the aesthetics of their farm with trees, and has turned into a successful and profitable tree farming enterprise. David says he gets personal enjoyment from growing quality trees in the same way that cattle or sheep farmers enjoy producing quality animals.*

### Species and planting strategies

The Jenkins wanted to grow a variety of trees, including commercial species, that would protect and enhance the farm and also be profitable. So, in 1987, after first considering pines, they decided to plant Tasmanian bluegums (*Eucalyptus globulus*) as the main commercial species.

A 26 ha area of agroforestry was established in 1987. Since then, David and Dianne have established many species of trees in a variety of arrangements including woodlots, plantations, tree lines along creeks and shelter belts. Among their diverse plantings, they describe the bluegums for pulpwood as the 'bread and butter' of their tree farming enterprise. In 1995, the first returns from bluegums for pulpwood contributed significantly to their farm income. In the longer-term, many other species are being established and managed for sawlogs. Some of these are *Eucalyptus saligna* (Sydney bluegum), *Corymbia maculata* (spotted gum), *E. viminalis* (mann gum), *E. grandis* (rose gum), *Acacia melanoxylon* (Tasmanian black wattle) and *E. pilularis* (eastern states blackbutt).

### The agroforestry experience

#### Arrangement

The Jenkins' agroforestry site comprises Tasmanian bluegum and Sydney bluegum planted in a 2:1 ratio. The trees are in belts of three rows that run approximately north-south to maximise sunlight on pasture. The rows are 4 m apart to allow access, and trees in the rows are 2 m apart. The tree belts are separated by cropping or pasture bays or 'alleys' which are 25 m wide. This arrangement gives an overall tree density of 450 stems per hectare with 19 ha of pasture and 7 ha of trees. The Tasmanian bluegums were thinned

for chip logs at 8 and 10 years of age. The Sydney bluegums are being managed for sawlogs, some of the poorer form ones have been thinned and chipped.

#### Farm forestry's major benefits: David Jenkins

- Early income from thinnings (years 8 to 10).
- Shelter for stock and crops.
- Reduced run-off – less erosion.
- Lowering of watertable – 3 m over 10 years.
- Higher total income per hectare.
- Income diversification.

Cropping and then grazing in the early years allowed cash flow to be maintained while the trees were established. Oats and vetch were grown for hay during the first two years and stock were re-introduced in the second summer (December 1988). The agroforestry area had an increased stock carrying capacity in 1989 and 1990 as a result of the shelter afforded to livestock and pasture by the trees. Since 1992 the carrying capacity has steadily declined because of shading and the spread of tree roots into pasture bays. By 1997 the carrying capacity was down to 20 per cent. Over the first 10 years, grazing was estimated to average about 34 per cent of the normal amount. However, pasture production is expected to progressively increase after each thinning as the trees are thinned for sawlog production and more light reaches the ground.

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## Then and now snapshots



*Jenkins' agroforestry layout two years after planting. Three-row belts of *E. globulus* and *E. saligna* with hay cropped for a second year from alleys.*

*The same site at year 10 – harvesting and loading of chiplogs from thinnings.*



### *Wood production*

Thinning in 1995 and 1997 yielded about 1600 tonnes of chip logs (\$25/t) and 80 tonnes of small sawlogs (\$31/t). The trees grew at a rate of about 40 m<sup>3</sup>/ha/year within the rows. After thinning, the remaining Sydney bluegums are at a density of 100 to 150 stems/ha. These will be pruned or thinned as necessary to produce sawlogs at 20 to 25 years old. For harvesting, the Jenkins' agroforestry system proved as good as the best plantations in the area. Harvesting crews operated at their best work rate of 17 tonnes per hour or about 200 tonnes per day.

David and Dianne are concerned about prices for sawlogs. At about \$31/t, small sawlogs are worth only \$6/t more than chip logs – making it difficult to justify

the management necessary to produce them. However, at the final harvest after 20 to 25 years, the trees will be much larger and should attract a higher price per tonne. David and Dianne are considering marketing strategies to maximise returns from their trees, including processing and value-adding on the farm.

### *Profitability*

The returns over 25 years have been estimated by Peter Eckersley (Agriculture Western Australia) using David and Dianne's actual wood harvest and grazing records to 1997, and an estimate of timber and agricultural production after 1997. Assuming a discount rate of 6 per cent, the result is a financial return which is about 40 per cent greater with the agroforestry. However, it is



important to note that the returns from the agroforestry are not expected to exceed those from traditional farming until the final wood harvest, 25 years after establishment.

It is also important to note that this analysis does not take account of additional benefits from the trees such as a reduced salt and waterlogging hazard through lower watertables, reduced wind and water erosion and improved aesthetics.

- To make a fair comparison, returns are discounted by 6 per cent per year; this raises graph lines pre-1997 and lowers lines after 1997.
- David and Dianne's actual returns were used for the analysis until 1997; after this an average hay crop for agriculture was assumed in 1997 and 2007 with returns higher than grazing. For the wood harvest at 25 years of age, an average timber price of \$30/m<sup>3</sup> was used. The break-even price is only \$9/m<sup>3</sup>.

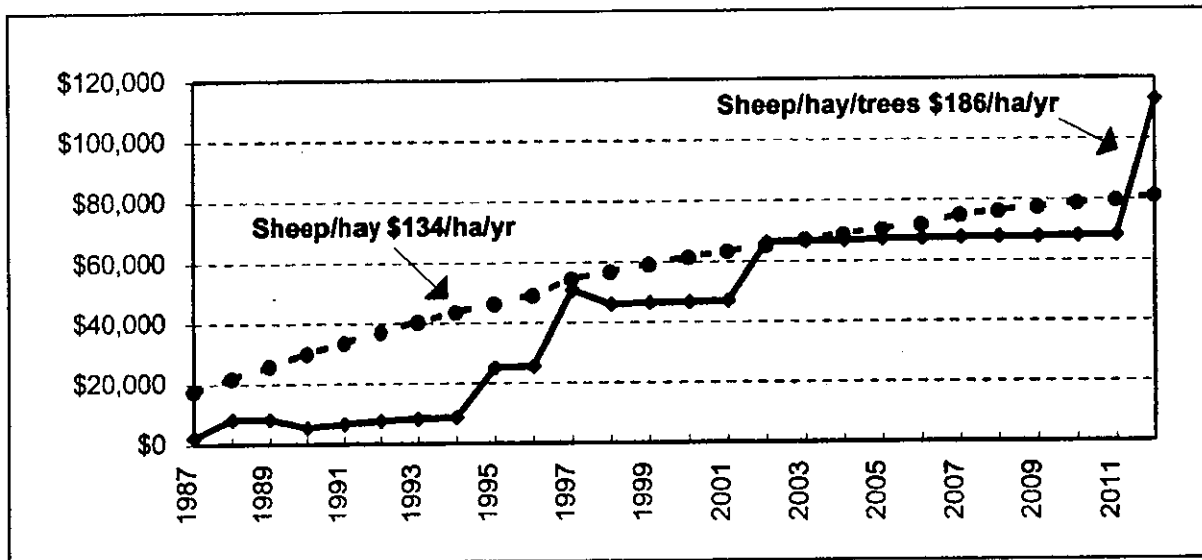


Figure 1. Cumulative net returns (in 1997 dollars) for a 26 ha paddock with bluegum agroforestry (sheep/hay/trees) compared to returns for the same sized paddock under traditional farm management (sheep/hay).



David Jenkins with nine-year-old mixed eucalypt pulp logs sold for a 'mill door' price.

## Effects of agroforestry

David and Dianne's summary of the features of agroforestry:

### (a) Agroforestry versus pure pasture

- Income from pulpwood thinnings at age 10.
- Income from sawlogs at age 20–25.
- Shelter from wind for stock and crops.
- Shade for stock (less likely to camp in one spot).
- Reduced run-off (especially when cropping), less erosion.
- Groundwater drawdown of 3 m since planting.
- Permanent saline creek now semi-permanent and brackish to fresh.
- Decreased surface salinity and waterlogging in valley.
- Increased bird activity.
- Aesthetically pleasing.
- Reduced pasture or crop in later years.
- Wind velocity reduced resulting in less fire risk.

### (b) Agroforestry versus plantation (for example, Tasmanian bluegum plantation at 1250 stems/ha)

- Extra income from grazing or cropping during the life of the trees.
- Less risk of tree death from moisture stress (especially in dry years).
- Less fire risk because of grazing, pruning, mulching and better access.
- Growth rates of individual trees are greater tending to compensate for reduced stocking.
- Lower total timber production.

## Managing the workload

Although more flexible in the timing of operations compared with stock work, tree farming still requires work to be done at certain times. Pruning needs to be done on time to obtain the best potential prices for sawlogs. David works on a rate of about 40 trees per hour for both low and high pruning.

For farmers funding their own tree farming ventures, he believes that there is more danger in trying to do too much rather than not enough. Instead of planting a minimum amount each year, he suggests working to a maximum amount of no more than 5 ha a year to start with. The philosophy is yearly planting equals yearly income. If you plant a bit every year, you will eventually get to the stage of receiving a regular income from trees no matter how long the rotation.

## Future plans

David and Dianne intend to plant up to 5 ha of *E. globulus* every year on suitable parts of the farm. This will provide more 'bread and butter' income from tree farming. They will use the opportunity to crop between the trees and re-pasture. Tree density will be about 800 trees per hectare. The Sydney bluegums are being thinned and pruned as necessary to produce sawlogs. They also plan to trial spotted gums on the dry sites which can't be cropped.

## The Land Management Society's Farm Visit Program

As part of the Land Management Society Farm Visit Program, you may visit David and Dianne Jenkins' farm near Bridgetown to see their farm forestry enterprise. Their farm is open to visitors on the second Monday of each month.

Book through the Land Management Society on (08) 9450 6862, fax (08) 9450 1763.

## The need for site characterisation

David and Dianne were among the first to discover the limitations of trees such as *E. regnans* (mountain ash) and *E. globulus* (Tasmanian bluegum) on shallow soils during dry years. They suffered almost 100 per cent loss with mountain ash and over 50 per cent loss with Tasmanian bluegums. David's initial idea of a soil evaluation was that it was acceptable if the ripper could get down about 50 cm, but in future he will do more. He says that if site selection is not adequate then all the work that follows may be a waste of time. The trees have grown well on the gravel loams high on the farm, but the problem has been on the shallower granite slopes further down.

## Further information

Contact your nearest office of the Department of Conservation and Land Management or of Agriculture Western Australia for the name of your nearest adviser representing the Farm Forestry Advisory Service. Other *TreeNote* titles are available from these offices in the higher rainfall area of southern Western Australia.

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