

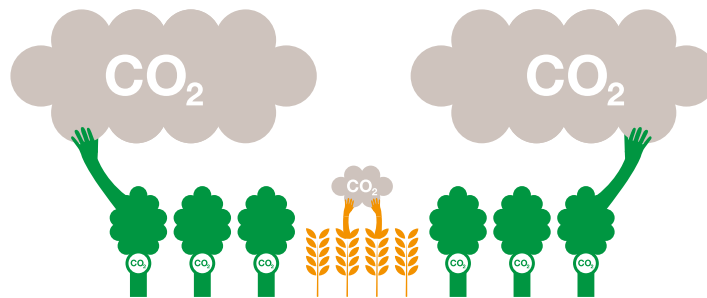
# Carbon Farming in WA

Fact sheet No. 17

## Practice: **Farm Forestry**

### Description of practice

Farm forestry is the integration of forestry activities with other agricultural activities, such as cropping and grazing, on a farm. Tree crops are usually managed to produce harvested forest products that include sawn timber, round timbers (fence posts), reconstituted wood products (particleboard and paper), sandalwood products and eucalyptus oils.



Farm forestry plantations are usually established on unproductive or marginally productive land. They may be established on cleared lands (reforestation) or they may be privately owned native forests. Reforestation may be established by planting or direct seeding in blocks or belts. Block planting involves large contiguous areas, with pasture and livestock grazing among the trees. Belt planting includes alley farming, timberbelts and shelterbelts, with agricultural production continuing in bays between the belts.

Farm forestry is now approved as a carbon sequestration method under the Sequestration methodology: Measurement based methods for new farm forestry plantations. Farmers can now obtain and sell ERF carbon credits known as Australian Carbon Credit Units (ACCUs). Subject to conditions—including that the new forests were established on land that was cleared (i.e. not forest) at the beginning of 1990—eligible farm forestry projects would also generate Kyoto ACCUs.

### Outline of procedure

Figure 1 shows how carbon accounting and claiming of carbon credits might work in a farm forestry project.

This example is a simple reforestation project with all initial establishment in one year (year 0), with each rotation clearfelled after 25 years and replanted after one year fallow. Claimable changes in carbon are shown in Table 1.

Note that for each reporting period, any project emissions (e.g. from vehicle running) need to be deducted from any claimable increase in carbon stocks to calculate carbon credits due.

Figure 1 illustrates how a farm forestry project with carbon revenue can benefit farm cash flows. The permanence requirements for ERF projects

The Department of Agriculture and Food is the lead agency and is working with the Department of Regional Development and Lands to deliver this Royalties for Regions funded project.

For more information please refer to [agric.wa.gov.au](http://agric.wa.gov.au)

### More Information

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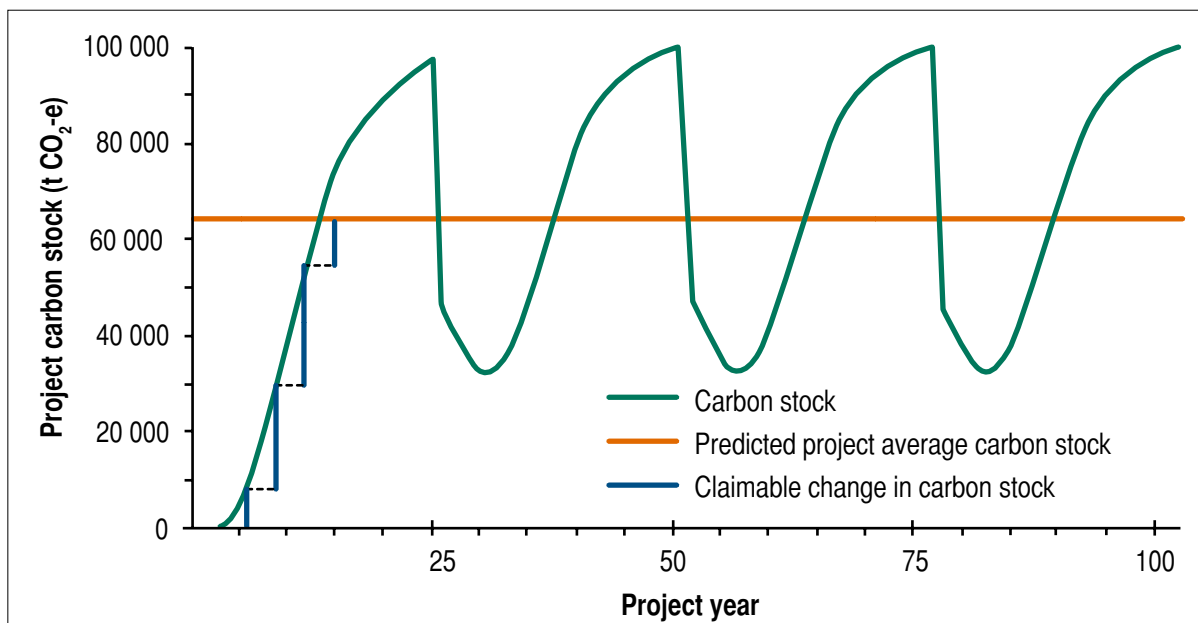


Figure 1 Example of a possible carbon stock profile over four rotations, showing predicted project average carbon stock (PPACS) and claimable change in carbon stocks (CCCS) at three-yearly reporting intervals.

mean the carbon stocks must be maintained for 25 or 100 years, though periodic harvest and replanting is allowed. But whether or not the reforestation is harvested, the carbon credits all accrue in the early years of a 100-year period. (In the Figure 1 example, carbon revenue ceases after year 18.)

The benefit of combining the carbon and harvest revenue streams is that carbon revenues may provide the early returns in the period before first harvest, potentially paying for establishment of the first rotation. Replanting after harvest will be required but some revenue from the sale of harvest products may cover that.

### Work done to date

Considerable work has been done measuring and predicting sequestered carbon in reforestation, for both non-harvest and harvest options. That includes developing biomass prediction equations (allometrics) for above-ground biomass and root biomass to facilitate carbon inventory, and developing predictive models for plantation forest growth. However, some farm forestry options have received little research attention, with plantation sandalwood a notable example.

Table 1 Claimable change in carbon stocks from the example in Figure 1

Project year	Claimable change in carbon stocks (t CO <sub>2</sub> -e)
31	275
6	7 616
9	21 521
12	24 661
15	9 411
18-100	0
Total	63 484

### Current level of adoption

The area of plantations under farm forestry in Australia is estimated to be around 155 000 ha, with 39 per cent of that in Western Australia (URS, 2008). Most planting has been for sawlog production (pine and eucalypt species) with substantial areas of oil mallees and sandalwood. Much of the plantations have been established through government and private investment in sharefarming or land lease arrangements. Only plantations on farmer-owned land are considered 'farm forestry'.

## Industry activity

While some farmers have planted trees purely for carbon purposes in Western Australia (WA), all plantings initiated since July 2010 could be grown for carbon credits as well as used for other forest products. As the methodology for harvested systems has only recently been approved, no plantings have been specifically initiated to claim carbon credits as well as to sell harvested products. Some oil mallee plantings still in the planning stage can potentially be used for carbon sequestration, with the main goal the production of biomass for electricity generation. A sawlog production system will require management from an early stage (pruning and thinning) if the trees are to be used to generate forest products as well as carbon.

## Benefits and opportunities

Over the 25 years required for a reforestation project in the ERF, a farm forestry project can deliver carbon revenue in the early stages, then returns from the sale of products once harvest commences. Potential benefits of farm forestry include:

- diversification of income sources
- sustained cash flow
- landcare and environmental benefits, such as salinity mitigation, erosion control and increased biodiversity.

## Risks

- Proximity to mills and other processing centres is important because transport costs can be prohibitive.
- Price volatility—especially for carbon credits.
- The permanency requirement (i.e. the requirement to deliver on carbon sequestration up to 100 years).

## Case study

Although no examples are available to use as case studies, a publication by [Harper et al. \(2007\)](#) describes a hypothetical stand of blue gums and pines planted in a 600 mm rainfall zone for both carbon and timber production. In conjunction with the figure and table presented above, the paper demonstrates that a much higher volume of

carbon can be stored using the carbon plus harvest model.

## Key contacts – Western Australia

- Kim Brooksbank, Jon Brand (DAFWA)
- David McFall (Oil Mallee Association)
- Bethan Lloyd (Australian Sandalwood Network)
- Simon Dawkins (Oil Mallee Association)

## International work

None at this stage.

## Stakeholders

- Farmers
- Rural communities
- Forest products industries
  - sawmills
  - woodchip exporters
  - sandalwood processing facilities
  - potential bioenergy plants
- Carbon trading companies
  - Carbon Conscious
  - Auscarbon
  - Carbon Neutral
  - Elementree
  - Greenfleet
  - CO2 Australia
- Local councils (planning)
- State government agencies
  - Department of Agriculture and Food, Western Australia (DAFWA)
  - Department of Environment and Conservation (DEC)
  - Forest Products Commission of Western Australia (FPC)
  - Department of Water
- Regional groups
  - South Coast NRM
  - South West Catchments Council (SWCC)
  - Wheatbelt NRM
  - Avon Catchment Council (ACC)
  - Northern Agricultural Catchments Council (NACC)
  - Rangelands NRM

## Next steps

Various organisations and individuals continue research and extension activities into farm forestry. They include state and federal government groups, universities, cooperative research centers (CRCs) and natural resource management (NRM) groups. For example, the Forest Science and Industry Development Group within FPC is studying farm forestry options, including eucalypt and pine sawlogs, sandalwood, and biomass/bioenergy from harvest residues.

## Publications – research and extension

Farm Forestry Advisory Service 1997a, 'Preparing sites for tree planting', *TreeNote* 2, Agriculture WA and Department of Conservation and Land Management, Perth, Western Australia.

Farm Forestry Advisory Service 1997b, 'Pruning trees for sawlogs', *TreeNote* 4, Agriculture WA and Department of Conservation and Land Management, Perth, Western Australia.

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Ritson, P & Sochacki, S 2003 'Measurement and prediction of biomass and carbon content of *Pinus pinaster* trees in farm forestry plantations, south-western Australia', *Forest Ecology and Management*, vol. 175, pp. 103–17.

Shea, S 1998, 'Farming carbon', *Landscape*, vol. 14 spring, pp. 17–22.

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