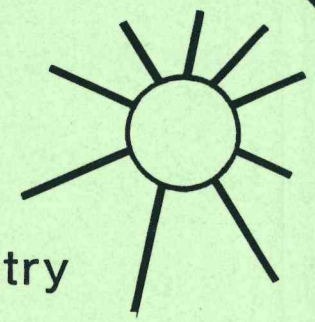
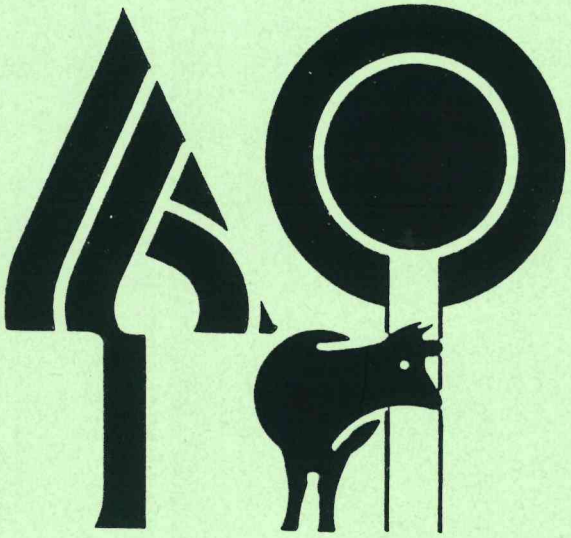
Agroforestry Update



Newsletter for Agroforestry Researchers and Practitioners



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FORESTRY SHAREFARMING TO TREAT LAND/WATER DEGRADATION IN WESTERN AUSTRALIA

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The need to develop farming systems which do not contribute to land and stream salinity has been a major motivation for agroforestry research in Western Australia. Such farming systems require two major features:

- must be capable of nearly complete utilization of rainfall to deplete the local groundwater systems which drive the salinity problem,

- must be economically competitive with conventional agriculture since such large areas are affected by salinity that it is beyond the State's capacity to subsidize extensive rehabilitation.

In recent years, the eutrophication of coastal plain wetlands and estuaries has emerged as a major problem. This problem arises from the leaching of fertilizer phosphorus from poor sandy soils into drainage water, and, like salinity, is driven by the water surplus available under present farming practices.

Some idea of the scale of these problems can be gained from the statistics that more than 50% of the previously fresh (< 500 mg/L total salts) water resources of the south west of Western Australia has been degraded by salt and all coastal plain waterbodies in farmland areas suffer incipient to serious eutrophication. More than 1 million ha of farmland with reasonable forestry potential (i.e. > 600 mm rainfall) are affected.

In an attempt to develop a forestry solution to these problems CALM has, for more than a decade, been involved in a project to identify tree species and genotypes with superior water use characteristics. Alcoa of Australia has been a major sponsor of this work since it has also been designed to identify species suitable for rehabilitation of bauxite mined land in the Northern Jarrah Forest where salinity risk also occurs.

The project is based on five major species screening trials distributed across typical salt prone and mined sites. Some 70 eucalypt species were included with an average of two seed lots for each species. A plot size of 0.5 ha was chosen to permit rigorous evaluation of water use performance. The selection of species was biased to slow growing inland species, thought likely to be better adapted to the quite harsh Darling Plateau environment, and more likely to mimic the slow growing, deep rooted native species with their generally outstanding capacity to maintain transpiration during the arid summer. However, some more rapid growing forest species with commercial potential were also included.

During 1985-7 detailed evaluation of growth performance and water use characteristics was undertaken. Some slow growing, high water use species were identified, most notably E. microcarpa and E. sideroxylon, the former able to sustain its performance on salt affected soils over shallow saline groundwater. It was also noted that some species with good wood volume production also had good water use, most notably E. botryoides, E. globulus and less so, E. viminalis.

From this work some 20 species indicating promising growth and/or water use have been selected for comprehensive seed collection over their native range. These collections, now completed by CSIRO, are being planted out in provenance and family trials throughout the south west.

The major famland tree planting operations in Western Australia has been for the rehabilitation of the Wellington Catchment and for the establishment of pine plantation in higher rainfall (non-saline) forest areas.

The Wellington Catchment project commenced in 1976. Since then the State has purchased and planted more than 5,000 ha using mainly slow-growing non-commercial species. The low timber returns and high purchase cost of the land have made this operation very expensive (approximately $1,000/ha). However, the operation was considered imperative to arrest the rapid decline in water quality of the Wellington Reservoir.

For many years the State and private investors have been buying high rainfall farmland at the rate of about 1,000 ha/annum for establishment of pine plantation. The State has augmented private land purchase with clearing native forest to achieve the planned rate of pine establishment of 2,000 ha/an. However, in the early 1980s the cost burden and increasing community objection to farmland purchase, along with the political decision to discontinue the clearing of native forest, meant that CALM had to seek an alternative method of pine planting on farmland. A study was commissioned which indicated that pine production was economically competitive with other extensive agricultural enterprises, but that the distribution of costs and returns over time excluded it as an option for most farmers to undertake independently.

CALM therefore developed a method by which the risk and uneven cash flow of pine cropping was eliminated. It was called the Softwood Sharefarming Scheme. Under the Scheme the State and the farmer contract to share establishment and management costs. The State underwrites expected future revenue and, after covering its costs, pays the farmer the discounted revenue surplus as an annual payment. The Scheme was first introduced in the non-saline forestry area around Manjumup. After a slow start at Manjumup it was extended into the lower-rainfall salinity-prone Albany area. It generated considerable interest. Farmers saw it as an attractive addition to their cropping choices. Land management researchers saw its potential for treatment of water quality problems. However, the Western Australian pine industry is competitive on the local market which only requires about 2,000 ha/an of plantings. Land with reasonable forestry potential (> 600 mm rainfall per annum), much of which has pressing water quality problems, exceeds 1 million ha. To open the potential to extensively plant trees across this area to gain a water quality benefit would require a major new timber industry.

The logical industry is short-rotation eucalypts for pulp. The species screening work had shown that some species had promising records of performance both in water use and growth. A rapid evaluation of widely scattered existing plantings of E. globulus confirmed generally reasonable yields. Investigation of world market opportunity also revealed considerable promise. The sound commercial prospects and substantial likely secondary benefits have given the State confidence to undertaken full scale feasibility study for a major pulpwood industry. As a further expression of confidence some 2,000 ha of sharefarming plantings of E. globulus have been undertaken in 1988.

At this early stage plantings are all plantation form mainly for legal and practical convenience. However, it is likely that the full development of forestry sharefarming will only be realized with development of a wide range of options including agroforestry. A major grant under the Commonwealth National Afforestation Programme has been awared to develop the potential of eucalypt cropping as an integral part of farming systems.

AGROFORESTRY DEMO FARM AT BAMBRA

From "Weekly Times", February 17, 1988.

It has been said that farmers learn best by example. If that is the case the agroforestry demonstration farm being developed at Bambra in the Otway Ranges should encourage hundreds of farmers to try agroforestry.

The 42 hectare farm is owned by Rowan and Claire Reid.

Rowan, a qualified forester, is known to many farmers as the co-author of "Agroforestry in Australia and New Zealand". His idea to develop a demonstration farm arose out of his frustrating search for examples of different agroforestry systems in Victoria.

"Good examples of agroforestry are so scarce that most farmers still can not picture how an agroforest might look. What we hope to achieve here is a collection of different agroforests involving many native and exotic tree species. There are nut trees, timber trees, fodder trees and trees for shelter, fire protection, soil erosion control and wildlife all planted on a working sheep farm" he said.

The Reids graze Drysdale carpet wool wethers and are training them to agroforestry. "Presently we are using a single electric wire loop around trees with good success."

"The biggest problem with protecting young trees is the cost of the guard. The electric loop is very cheap especially if two trees are planted in the one loop. This idea suits timber species since heavy culling is necessary to ensure a good stand. Our first culling will simply involve selecting the best of each pair."

Although the farm was only purchased last Februray already over 2,000 trees have been planted from more than 40 species.

Timber species include radiata pine, eucalypts, black walnut, Californian redwood, poplars, silky oak and blackwood. Grafted chestnuts, pecans, walnuts and almonds as well as fruit trees are planted for food and tagasaste, honey locust and willows for fodder.

For farmers interested in trying any type of agroforestry Bambra Agroforestry Farm will provide a good guide as to how to, or even how not to, proceed.

Note: Although the farm is not yet open to visitors on a regular basis an informal field day is planned for May 8. Anyone interested is invited to contact Rowan on (052) 88-7247 or write to Bambra Agroforestry Farm, Aireys Inlet Road, Bambra 3241.